

# FACILITIES manager

NOV/DEC 2014

## HIGHER EDUCATION *and the* **AMERICAN** **EXPERIENCE**

### INSIDE

The Power of Lean

Administrative  
Service Systems

2014 Thought Leaders  
Report, Part 2

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## HIGHER EDUCATION and the **AMERICAN EXPERIENCE**



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### Higher Education and the American Experience: Community, Democracy, and New Frontiers

*By Anita Blumenthal*

At a plenary session at APPA's Centennial Conference last July, Professor Jeremi Suri traced the unique history of higher education in the United States, and he challenged the audience to find ways to enhance the distinct contributions and ethos of American universities while meeting new challenges with fresh ideas and practical innovations.



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### Tackling Critical Facilities Issues through the Hidden Power of Lean (It's not what you might think)

*By Melissa McEwen, Meredith Hargreaves, and Steve MacIntyre*

Campus facilities leaders are facing many intractable challenges—deferred maintenance, reduced funding, rising costs, an aging workforce, broad energy and sustainability targets, and much more. As facilities leaders, we want to understand what best practices exist on other campuses, so that we can bring those great ideas to back to our own campus and replicate them.

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### We Built, We Bought, We Shared: The Costs of Administrative Service Systems vs. the Academic Mission

*By Eric L. Denna, Steven R. Fleagle, Laura McCain Patterson, and Thomas Dodds*

Higher education institutions need to minimize the costs of administrative systems in order to invest in their core missions. Here, seasoned CIOs talk candidly about three strategies: building-your-own in the modern era; buying and implementing in smarter ways; and joining a higher education consortium that shares processes and software.



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### APPA Thought Leaders Report 2014, Part 2, *Leveraging Facilities for Institutional Success*

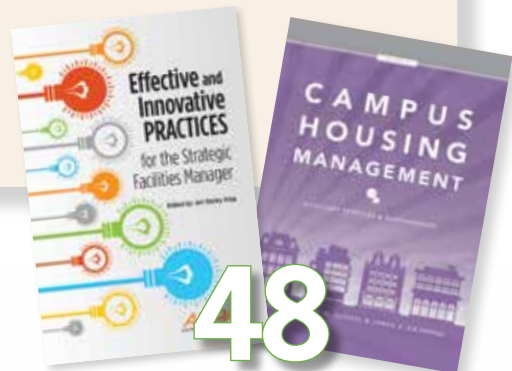




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### About APPA

APPA promotes leadership in educational facilities for professionals seeking to build their careers, transform their institutions, and elevate the value and recognition of facilities in education. Founded in 1914, APPA provides members the opportunity to explore trends, issues, and best practices in educational facilities through research, publications, professional development, and credentialing. Formerly the Association of Physical Plant Administrators, APPA is the association of choice for more than 13,000 educational facilities professionals at more than 1,500 learning institutions throughout the United States, Canada, and abroad. For more information, visit us at [www.appa.org](http://www.appa.org).

## PROMOTING THE SMART AND SUSTAINABLE CAMPUS

### APPA continues its involvement

in a number of programs focusing on aspects of environmental stewardship and campus sustainability. Within the past year, APPA has published two related books in the new Critical Issues in Facilities Management series: *Energy Efficiencies* and *Environmental Sustainability*. Both titles have been selling well and are available in the APPA bookstore at [www.appa.org/bookstore](http://www.appa.org/bookstore).

APPA again serves on the program committee for the 10th annual Smart and Sustainable Campuses Conference, to be held March 30-31, 2015 in Baltimore, Maryland. APPA and coordinating host, the University of Maryland, are the only two organizations that have been with the conference from its beginnings ten years ago. The conference theme is Honoring Our Past, Charting Our Future, and will include a wide array of presentations, workshops, plenary speakers, and exhibit hall business partners to provide a focused and manageable learning and networking opportunity. Learn more about the conference at [www.sustainability.umd.edu/content/community/SSCC.php](http://www.sustainability.umd.edu/content/community/SSCC.php).

The March/April 2015 issue of *Facilities Manager* will highlight campus sustainability and net-zero buildings, among other topics, and will be distributed to attendees of the Smart and Sustainable Campuses Conference.

Another effort that APPA supports from a content standpoint is the Campus Environmental Resource Center, or CampusERC. The CampusERC was established to provide individu-

als and educational institutions with the knowledge and tools to maintain environmental regulatory compliance, improve management, and operate sustainably. The CampusERC website was developed by a grant from the U.S. Environmental Protection Agency and led by the National Association of College and University Business Officers, with content and promotional assistance




**SMART AND  
SUSTAINABLE  
CAMPUSES  
CONFERENCE**



from APPA, the Campus Safety Health and Environmental Management Association, and C2E2. We urge you to visit and use the resource center at [www.campuserc.org](http://www.campuserc.org).

These are just a few of the ways in which APPA supports, develops, and promotes good environmental stewardship at educational institutions.

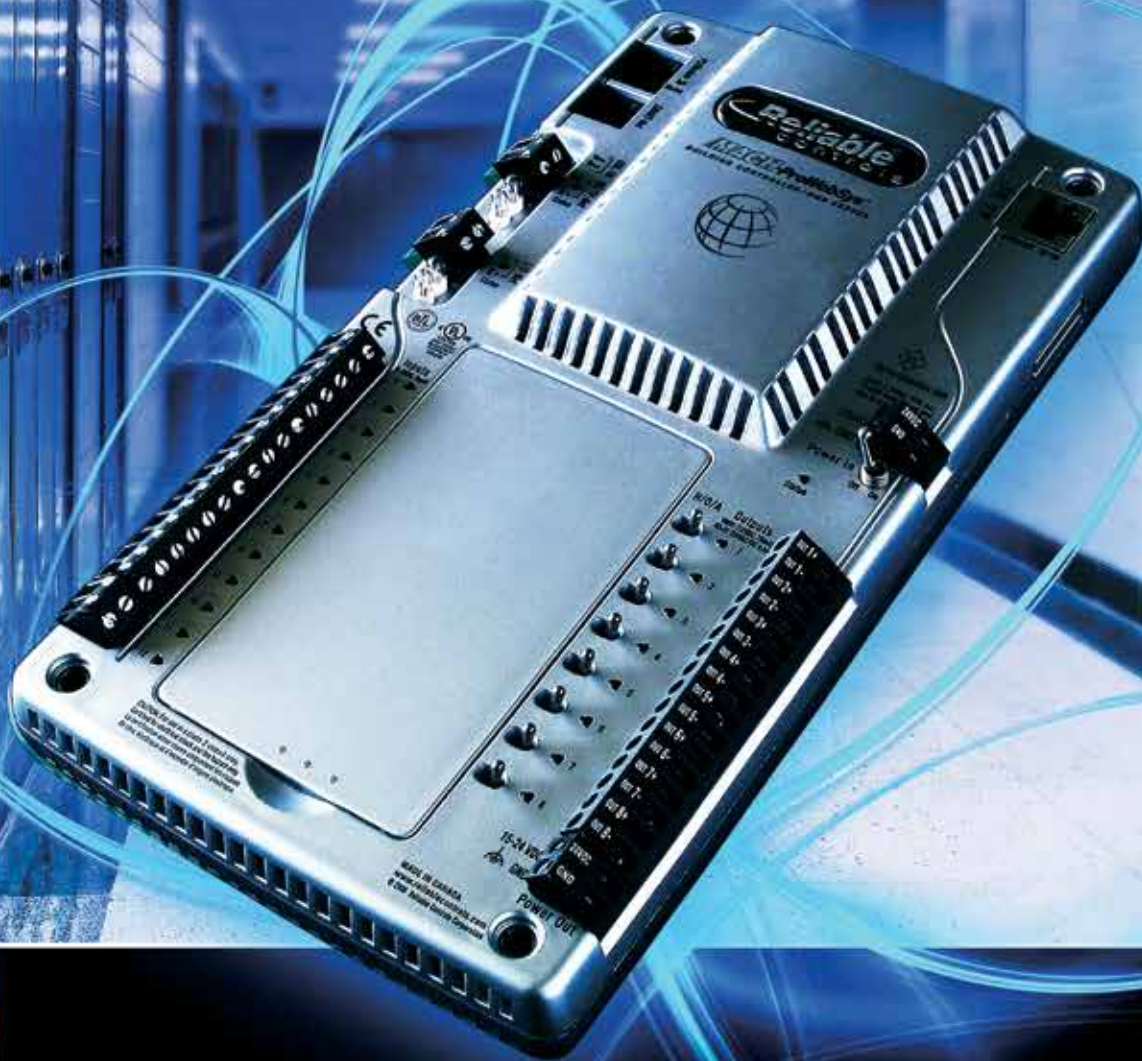
Others include programming in energy, sustainability, and leadership at the Institute for Facilities Management and at our annual conference, the next of which will be August 4-6, 2015 in Chicago, Illinois. 

### Coming in Jan/Feb 2015

- Planning, Design, Construction
- P3, Public-Private Partnerships
- Building & Systems Commissioning
- Reports from 2014 Regional Conferences



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# facilities digest

By Anita Dosik

## Save the Date!

**APPA 2015 Annual Meeting & Exposition**  
August 4–6, 2015 • Chicago, Illinois



**Mark your calendars to attend next year's  
APPA Annual Meeting & Exposition!**

APPA 2015 will be held August 4–6, in Chicago, Illinois. You won't want to miss this exciting gathering of fellow facilities professionals and exceptional speakers!



### APPA 2014 PHOTOS AVAILABLE ON SHUTTERFLY

You can still access and download electronic images of the APPA 2014 annual conference from our Shutterfly photo albums at <https://appa100years.shutterfly.com/>. You can also purchase prints and have them shipped to you.

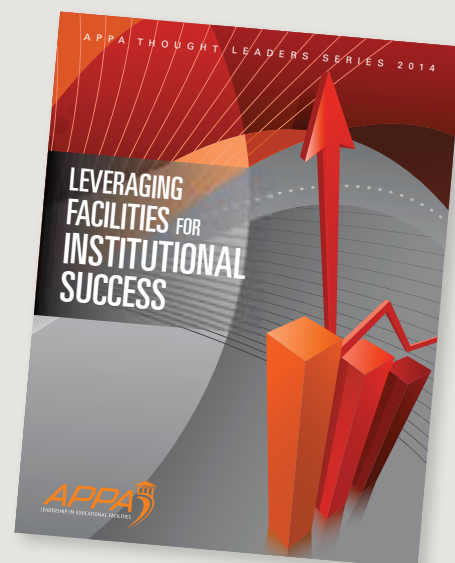


### LEVERAGING FACILITIES FOR INSTITUTIONAL SUCCESS: APPA PUBLISHES 2014 APPA THOUGHT LEADERS REPORT

The 2014 Thought Leaders report, *Leveraging Facilities for Institutional Success*, has now been published and posted to the APPA bookstore. You will find a full description of this product as well as ordering information at [https://www.appa.org/bookstore/product\\_browse.cfm?itemnumber=761](https://www.appa.org/bookstore/product_browse.cfm?itemnumber=761).

Be sure to share this with your committees, regions, and other interested parties. There is no charge for the report, and it is available as a PDF download. APPA has published the first half of the new report in the Sep/Oct issue of *Facilities Manager*, and you can find the second half of the report in this issue.

APPA thanks DTZ, a UGL company, and Jacobs for their continued support of APPA's Thought Leaders Series.





## ADVERTISE YOUR POSITION OPENINGS IN JOB EXPRESS

If you are looking for a highly qualified pool of candidates for a facilities management opening, Job Express can help you. Your ad will be posted online where it can be seen by thousands of facilities professionals who access APPA's website.

The Job Express audience consists of professional facilities managers in top executive-level positions, individuals who are retiring from the military with extensive facilities and engineering experience, graduates of APPA's Institute for Facilities Management, and members who have earned the EFP or CEFP credential.

Job Express gives you market exposure through its online postings. All ads appear in one format for one low cost and are hosted online for eight weeks! Add e-mail and website links so that applicants can reach you at the click of a button. To find out more, go to <http://www.appa.org/jobexpress>.



## WHAT'S IN A NAME? THE EVOLUTION OF APPA'S NAME

Do you ever wonder what "APPA" stands for? Well, APPA has had several names over its 100 years of existence.

When APPA first began in 1914 it was called the Association of Superintendents of Buildings and Grounds of Universities and Colleges. In 1948, the name became the Association of Physical Plant Administrators of Universities and Colleges, followed in 1954 by the National Association of Physical Plant Administrators of Universities and Colleges (NAPPA.) Then, in 1969, the name became the Association of Physical Plant Administrators (APPA.)

In 1991, to reflect the association's growth in service to the broadest range of educational facilities professionals, the name was tweaked to APPA: The Association of Higher Education Facilities Officers, and most recently, since 2007, the association is known simply as APPA, with the tag line Leadership in Educational Facilities.

Throughout the many name changes, "APPA" has endured as the acronym most easily recognized and referred to for the organization.



## APPA EVENTS

**Jan 18-22, 2015** APPA U: Institute for Facilities Management and Leadership Academy, *Tampa, FL*

**Jan 23-24, 2015** EFP and CEFP Prep Course and Exam, *Tampa, FL*

**Mar 30-31, 2015** Smart and Sustainable Campuses Conference, *Baltimore, MD*

**Aug 4-6, 2015** APPA 2015 Conference and Exposition, *Chicago, IL*

For more information or to submit your organization's event, visit [www.appa.org/calendar](http://www.appa.org/calendar).



## COMING UP: APPA U IN TAMPA

The next APPA U will take place January 18-22, 2015 in Tampa, Florida. Combining both the **Leadership Academy** and the **Institute for Facilities Management**, APPA U offers a wide array of educational opportunities in a central location twice a year. In addition, the **EFP and CEFP Prep Course and Exams** are also made available for your convenience at APPA U.

## The APPA U Experience

The **Leadership Academy** has been developed for the educational institution's administrative professionals. It provides opportunities for professionals to increase their awareness of industry issues, to learn the skills necessary to handle today's changes, and to discover their own leadership potential.

At the APPA **Institute**, students select one core area as the focus of their classes at the venue. Morning classes consist of required courses, centering on the core area selected. Afternoon classes comprise electives chosen by the student and may be a combination from any of the four core areas.

The **EFP and CEFP Credentialing** opportunities consist of a prep course and exam. These are geared to allow educational facilities professionals to demonstrate a career commitment to ongoing professional development, and to demonstrate their qualifications and industry knowledge to their institution.

For additional information about APPA U, contact Suzanne Healy at [suzanne@appa.org](mailto:suzanne@appa.org). For information about APPA Credentialing programs, contact Christina Hills at [christina@appa.org](mailto:christina@appa.org).

## APPA CONGRATULATES CEFP & EFP RECIPIENTS

The following professionals have successfully completed the requirements for APPA's CEFP and EFP credentials, from August 15, 2014–September 29, 2014. Congratulations on their personal accomplishments.



### CEFP RECIPIENTS

Juan Allen, *American University*  
Mark Allen, *Wayne State University*  
Marty Autry, *University of New Mexico*  
Robert Avalue, *The College of William and Mary*  
Jeff Brown, *Immaculata University*  
Glenn Carey, *Johns Hopkins University/  
Applied Physics Lab*  
Richard Clark, *University of Nevada/Las Vegas*  
Thomas Flood, *Elon University*  
Tiger Funk, *Southern Utah University*

Theresa Giardino, *Montclair State University*  
Ronald Henderson, *Southwestern Illinois College*  
Luce Hillman, *University of Vermont*  
Steven Hultin, *Colorado State University*  
Sylvester Johnson, *Tulane University*  
William Keslar, *Building Solutions*  
Andrew Krouse, *Indiana University/South Bend*  
Julie Larmore, *Southern Utah University*  
Edwin Lehman, *Eastern Mennonite University*  
Joseph Martinez, *The College of William and Mary*  
Anthony McClellan, *University of Illinois/Chicago*  
Carl McLaughlin, *University of Michigan/  
Ann Arbor*  
Walter Molishus, *University of Pennsylvania*  
Jimmy Muniz, *University of Colorado/  
Colorado Springs*  
Scott Perelstein, *Northern Arizona University*  
Jeffrey Pleta, *Community College of Allegheny  
County*  
Burl Sumlin, *Auburn University*  
Kent Taylor, *New Mexico Military Institute*  
Kathleen Viskocil, *Northern Arizona University*

### EFP & CEFP Course and Exam Schedule

January 23-24.....Tampa, FL (APPA U)

For further details, go to [www.appa.org/](http://www.appa.org/)  
and click on training.

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### EFP RECIPIENTS

Abbot Kastanek, *Grand Rapids Community  
College*  
Hye (Helen) Lee, *American University*  
Joe Milito, *Grand Rapids Community College*  
Robert Slavik, *Colorado School of Mines*  
Timothy Smith, *Arizona State University*  
Michael Wheeler, *Boise State University*





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# APPA's Financial Health at its 100-Year Mark

By E. Lander Medlin

Our membership should again be pleased with APPA's financial health and success. The fiscal year ending March 31, 2014 APPA posted an outstanding surplus of \$260,446 and restated its March 31, 2013 surplus position to a higher positive balance of \$159,065. As a result, this afforded us the opportunity to increase our commitments to both our operating and capital reserves to an increased level of \$500,000 (with Operating now at \$400,000 and Capital at \$100,000). The APPA headquarters building not only held its value but appreciated slightly with an assessment at approximately \$2.36 million as of February 2014 by the City of Alexandria. APPA owns its headquarters offices outright.

## TAKING A CONSERVATIVE APPROACH

The APPA staff and the Board of Directors understand the budget pressures our members face in this challenging economy given the continued slow economic recovery in both the U.S. and across the globe. Therefore, we continue to take a conservative approach with our budget while focusing on offering value and quality services for our members.

APPA experienced an operating surplus this year given a stellar turnout of registrants for both of the APPA U (Institute for Facilities Management and the Leadership Academy) program offerings last year. We also had a significant uptick

in regional and/or institutional deliveries of Supervisor's Toolkit, Drive-In Workshops, and the Academy-on-Campus programs. The regions are really on top of local deliveries and getting grassroots involvement. We were equally pleased with the turnout at the APPA 2013 Conference held in Minneapolis, Minnesota. Overall, our face-to-face educational programs are doing very well, thereby positively adding to the net bottom line. Additional revenue from job advertising sales (Job Express) greatly contributed to this surplus as well. We are continuing to focus on and further recalibrate all programs and their cost of delivery during this present fiscal year (2014-2015) to achieve a balanced budget.

## FINANCES AT A GLANCE

Graph 1, on the opposite page, shows the eight-year history of revenues and expenses for APPA. Revenues continue to grow from our low point after the Great Recession (March 09-10). Expenses have stabilized somewhat given some creative approaches to managing our long-term hotel contracts and combining two major educational programs under the APPA U umbrella.

Graph 2, also on the opposite page, shows this past year's revenues and expenses by activity/program. Membership expenses, totaling \$464,665, reflects the direct cost of membership department

salaries and benefits, travel and outreach efforts, printing, production and mailing of promotional materials, and other program supplies and equipment needs for the recruitment and retention of institutional members. However, and most importantly, membership dues also provide significant support for the direct cost of many APPA activities/programs such as Publication's preparation and delivery of the *Facilities Manager* magazine; website and database management; a portion of research and development; overall office operation; and planning and governance. Revenues and expenses are planned and monitored by staff and the APPA Board to achieve APPA's mission to support educational excellence with quality leadership and professional management through education, research, and recognition.

At this mid-year mark (September 30, 2014), we successfully delivered the 100-year anniversary celebration in San Diego, California. Several years of planning went into the final delivery of this event. Although an expensive proposition, all that attended were pleased with the outcome. An organization only turns 100 years old once! We developed and delivered several centennial video clips to memorialize APPA and, more importantly, look ahead to the issues and challenges the educational facilities profession, the built environment, and the education enterprise will face well into the future.



These video clips are available on APPA's YouTube site. Notably, they are being used to educate and inform facilities staff and senior institutional officers. You should plan to do the same at your institution!

#### APPA'S ANNIVERSARY GIFT

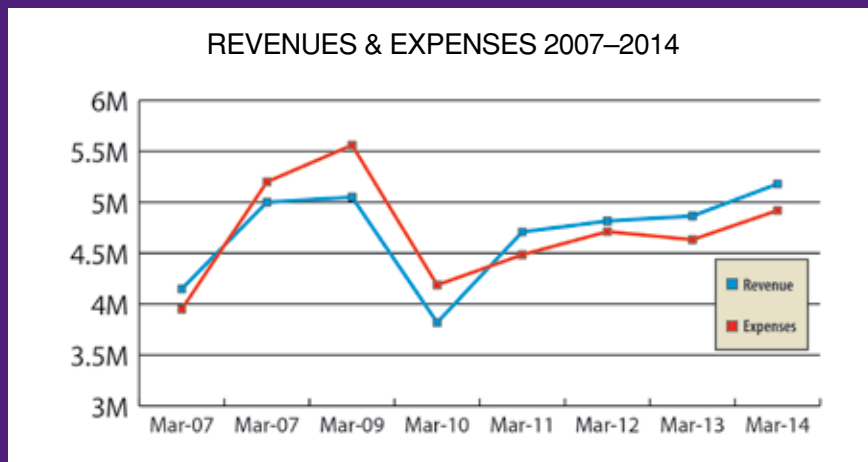
We also crested the 100-year mark with a huge gift to our members and potential new members. That gift is institution-wide membership for one flat institutional dues amount. That's right, every individual at any member institution who would like to be an associate member of APPA may do so just by establishing their own unique userID and password. It's easy to do. Just go to the membership section of the APPA website and sign up today! Now that's value and we all know APPA is the best value for everyone!

The Board and the APPA staff remain committed to delivering excellent programs, products, and services in as cost-effective a manner as possible. We will focus on non-dues revenue opportunities and provide you the best value for your membership. Our financial condition is enhanced by membership that is APPA active. Please encourage your peer institutions to be engaged in their professional organization. 📄

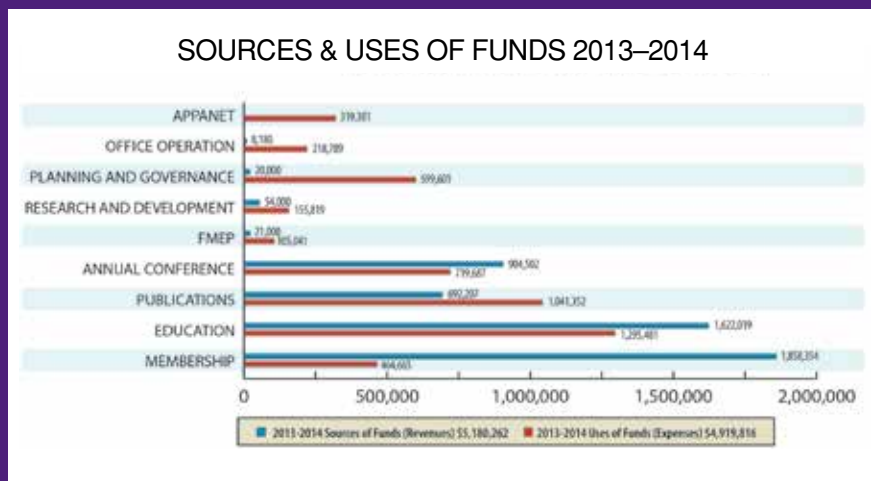
Lander Medlin is APPA's executive vice president; she can be reached at [lander@appa.org](mailto:lander@appa.org).



GRAPH 1



GRAPH 2



APPA has developed several centennial video clips to memorialize APPA and look ahead to future issues and challenges facing the educational facilities profession. You can view them at <https://www.youtube.com/playlist?list=PLw8xBpl-OqEZpzjnk3nM5UqTohxV8yqy0>.



# It's About Time

By Jeri Ripley King  
APPA Vice President for Information and Research



Everyone is “crazy-busy” these days. With all sorts of demands on our time, we often seek immediate answers to our questions. Thanks to APPA, we now have a wealth of information about educational facilities management that is available when we need it. While it is wonderful to have this information on tap for our use, it is even better to be part of the APPA team that focuses on growing and delivering information and research as a resource for APPA members.

from each of the six regions, three at-large members focused on special projects, an APPA staff liaison, and other associated APPA staff members. The regional representatives function as a go-between for the regions and APPA to promote the growth of information and research, and to spread the word about what is available.

I am currently in my last year of my three-year term as APPA's Vice President for Information and Research. For each of the years I have been part of the committee, our work has involved examining, updating, and building on the work of the committee members who came before us. During regularly scheduled conference calls and face-to-face meetings, the committee members use their various backgrounds and expertise to raise questions, test, refine, discuss, and offer advice about the references, tools, and methods of delivery.

As we work to grow APPA's collective body of knowledge, we find that the questions and issues we raise and the results of our discussions do double duty. Individually, we have recognized that the process has allowed us to learn and grow.

In turn, we are able to add more value to our departments and our institutions.

## SAVING TIME

The work of the Information and Research Committee has resulted in a

powerful series of reference materials for APPA members. However, its role is to promote the growth and dissemination of the knowledge we have gained. APPA institutional members, emeritus members, and business partners create the information and research. Due to the involvement of many, each individual can build on what others have discovered; this not only saves time, but also lets us grow by adding our experiences to APPA's collective body of knowledge.

One part of this collective body of knowledge is the aptly named *Body of Knowledge* (BOK), APPA's reference manual. It is available online, on demand, anytime, at no cost to anyone at our member institutions. Organized around the same four cores as the APPA Institute, the BOK is the text for the Educational Facilities Professional (EFP) and Certified Educational Facilities Professional (CEFP) credentialing program. Truly providing a way to have us all on the same page, the BOK is available for use as a reference for our staff members, students, building coordinators, and administrators.

The *Facilities Manager* magazine captures articles about effective practices and new perspectives, and makes them available in print and online. The magazine not only includes a rich array of feature articles and research summaries, it also offers regular columns, such as Knowledge Builders, which offers nuggets of information gleaned from various sources, including the Facilities Performance Indicators (FPI).



## COMMITTEE TIME

For the past eight years, I have been part of the APPA **Information and Research Committee**. I began as a MAPPA representative to the committee. The committee includes one representative



The online FPI survey and report offers member institutions the ability to trend and benchmark their data, while also providing summary information for APPA staff, officers, and researchers about educational facilities and facilities departments. Over time, as part of our continuous improvement efforts, the committee members developed the now common definitions used in the FPI.

These definitions have allowed our members to more clearly describe, understand, explain, and manage our educational institutions' physical assets. Now, the committee is looking into expanding this effort into energy and sustainability with the Energy and Sustainability Assessment Tool (ESAT), which we are developing in conjunction with a business partner.

APPA provides educational facilities information in various forms, not just online. APPA has books, e-books, other publications, and newsletters. The e-mail APPAinfo discussion list rounds out the current methods APPA uses to share educational facilities information and research.

Is something missing? While we have amassed an impressive body of information and research, we need to make sure we stay current and fill in any gaps that may exist. To that end, the Information and Research Committee encourages all APPA members to consider writing or researching topics of interest and sharing their insights, practices, and findings through articles, publications, and research. In fact, the Center for Facilities Research (CFaR) is set up to help individuals complete research projects that will add to our knowledge base.

#### TIME WELL SPENT

During the past decade or so, I have had a number of roles that have involved information and research, from writer to editor, researcher to reviewer, and committee member to elected officer. In each of these roles, I found that the time I spent was dwarfed by the amount of useful information that I gained from the experience.

If you are interested in the work of the Information and Research Committee, please seek out your regional representative to find out more. The committee is always on the lookout for writers and researchers. We also invite you to consider volunteering to serve on the Information and Research Committee. From my perspective, anything you do with APPA

information and research will be time well spent. ☺

Jeri King is APPA's Vice President for Information and Research, and senior facilities services specialist at the University of Iowa in Iowa City, Iowa. She can be reached at [jeri-king@uiowa.edu](mailto:jeri-king@uiowa.edu).



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# 10,349 and Counting

*APPA's Unlimited Associate Membership brings the APPA Experience to many educational facilities professionals for the first time*

By John Bernhards

**A**pril 2014 marked a huge turning point for APPA “engagement.” Just one year earlier, the APPA Board of Directors approved a measure allowing employees from all APPA member institutions to become associate members of APPA and at no additional cost. As a result, we’ve seen an unprecedented number of educational facilities professionals join APPA and APPA’s six regions, most for the very first time. The number of associates from APPA and regional member institutions has jumped from 2,400 at the beginning of the current membership year (April 1, 2014) to 10,349 as of this writing.

And the number will continue rise sharply. At its monthly conference call, the APPA Membership Committee—led by APPA Secretary-Treasurer Jerry Carlson (Butler University)—set a stretch goal of 15,000 associates by the end of the current membership year, March 31, 2015.

As a fellow professional and member, you can help APPA achieve and exceed its associate membership target. APPA is making it easy for all educational facilities professionals at every APPA member institution to sign up for benefits, and here are two ways you can help make this happen at your institution:

**Sign up your facilities staff through your Primary Representative’s myAPPA page on the APPA website.**

If you are the person who serves as the


primary representative on behalf of your institution’s APPA membership, it means you are receiving the annual membership dues invoice and are also allowed to make changes to your institution’s membership record. In fact, your APPA userID and password will grant you access to your institution’s membership records available through the APPA website at [www.appa.org](http://www.appa.org). Simply log through the APPA home page, and you’ll be directed to your personalized myAPPA Web page where you can easily make changes to your institution’s membership record. It is where you can identify and enter all of your staff and make them APPA associates, and also remove former employees from the membership record.

**Direct your institution’s facilities staff to sign up for Associate Membership benefits through the “unlimited associates” portal found on the APPA home page.**

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Yet another option available to your member institution is to prepare a listing of your entire facilities staff on a prepared Excel spreadsheet that our membership staff can send to you on request. After properly completing the spreadsheet and required fields, your staff listing can be easily transferred into APPA’s membership record for your institution. To learn how to provide your department listing using an Excel spreadsheet, contact Sam Waymire at APPA at [swaymire@appa.org](mailto:swaymire@appa.org).

As the saying goes, APPA Associate Membership has its privileges! And as an educational facilities professional, you and your colleagues do not want to miss out on the many opportunities to network, engage, and connect with peers. For more details on the benefits of APPA Associate Membership, visit the APPA website at [www.appa.org/membership/associate.cfm](http://www.appa.org/membership/associate.cfm).

Empower your colleagues, peers, and staff and provide them with the single best professional opportunity available. In doing so, you’ll be certain to help us realize our goal of 15,000 APPA Member Associates by March 31st. 

John Bernhards serves as APPA’s associate vice president. He can be reached by telephone at 703-542-3848 and on e-mail at [john@appa.org](mailto:john@appa.org).



# Effective and Innovative Practices for the Strategic Facilities Manager

Edited by Jeri Ripley King

This book offers a sampling of tested-in-the-field practices and frameworks that can help educational facilities managers meet the challenges of today, as well as those in the foreseeable future.

Ever-tightening resources and pressures to work more efficiently and effectively call for a skill set that is able to assess the environment, advance new initiatives that are aligned with institutional goals, and help organizations behave more proactively. Those who can do that, and are able to communicate effectively with their constituencies, are more apt to thrive and help their organizations do the same.

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The background is an abstract, textured composition. The top left corner is a solid red rectangle. The rest of the image features a mottled, painterly texture in shades of grey, blue, and white. In the lower half, there is a dark blue horizontal band. Within this band, a silhouette of a city skyline is visible, including a prominent building that resembles the White House. The overall aesthetic is modern and artistic.

# Higher Education

and the

# American

# Exper

**Community,  
Democracy, and  
New Frontiers**

*By Anita Blumenthal*



# ience



Professor Jeremi Suri, University of Texas Austin, spoke on the history of American higher education in his keynote address at the APPA 2014 conference.

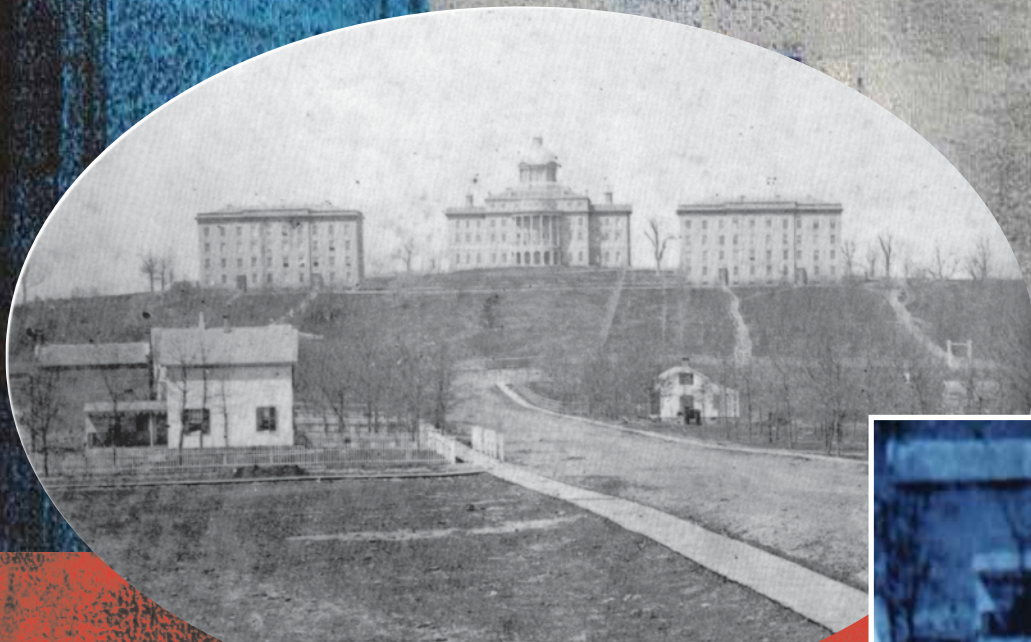
**T**he land and the built environment of America's colleges and universities have always meant far more than just the physical fabric; they have been both a source and a mirror of the unique features of American history and society, according to Dr. Jeremi Suri, the Mack Brown Distinguished Chair for Leadership in Global Affairs and professor of history, public policy, and global leadership at the University of Texas at Austin. At a plenary session at APPA's Centennial Conference in July 2014, Suri traced the unique history of higher education in the United States, and he challenged the audience to find ways to enhance the distinct contributions and ethos of American universities while meeting new challenges with fresh ideas and practical innovations. He noted repeatedly that the facilities management component of universities would have to do much of the heavy lifting.

"Universities as we know them are manifestations of our democracy as well as promoters of our democracy," he said. The experience of public higher education reflects the American experience, he explained, and what made American society—and universities—so different from those of other countries was the physical, psychological, and philosophical role of the frontier. Suri cited Frederick Jackson Turner, a major thinker about American democracy in the late 19th century, who said that American society was formed on the frontier. Above all, the frontier represented the ability to start over. "You are not defined by your family or background but by what you do in the open space to make your way," Suri said, and you do not do it alone; you do it in a community, working together. (This rich promise, he admitted, didn't apply to some populations, such as slaves or American Indians.)

## RECREATING THE PROMISE OF THE FRONTIER

This frontier ethos and promise applied to the many colleges and universities that were being founded in the 19th century, Suri explained. Many were founded literally along the frontier, in places that were not yet settled. Their origins were in the openness of new space, and they shared that sense of infinite possibility. In fact, Suri said, "Universities were formed as built environments before they were educational institutions. The buildings preceded the students—they structured the students." This was the perfect example of "If you build it, they will come."





The growing campus in the late 1800s. Left, University of Wisconsin Madison, below, University of Texas Austin.



And they did come. The settlers wanted a university. “Settlers wanted a place to go to learn to be better farmers, so they could manage their communities better, so they could read Shakespeare, so they could be civilized,” Suri said.

Reflecting the community component of the frontier experience, these frontier institutions were residential, unlike the European model. The buildings recreated a frontier mentality. “The idea of an American university is that you were not creating gentlemen; you were creating pioneering citizens,” Suri said, bringing people from diverse backgrounds together into a community to discuss important matters, working together to make their way forward. This residential component also meant that the physical place and identification with that place mattered from the start.

How did these institutions come about? As the new republic grew, two facts worked together. First, there was state and federal—and popular—support for public higher education, and second, both state and federal governments had more land

than money and thus could supply one but not the other. The country had—and still has—a plenitude of land. As early as 1785, the Georgia state assembly created the land-grant model: It allocated 40,000 acres to build the nation’s first public university. The land was not to be built on; rather it was to be sold, and the money from the sale endowed the university. That is, it paid for the property and buildings.

Other states followed suit. The federal government adopted the model when, in the midst of the Civil War, President Lincoln signed the Land Grant College Act of 1862, known as the Morrill Act, a landmark of enlightened legislation, which granted 30,000 acres of federal land to every state, to be sold to endow a university.

#### **TRANSFORMATION: THE GI BILL AND BEYOND**

“Universities were for productive gain and intellectual advancement,” Suri said. “If you want to understand our prosperity, it’s because universities have opened their doors in our society to more people than any other society.” And it was the federal government’s commitment, in another piece of landmark legislation, that made this opening of doors possible on an unprecedented scale. In the Servicemen’s Readjustment Act of 1944 (the G.I. Bill), the federal government committed to provide every veteran with a college education if they wished. This bill and its iterations over the years transformed universities and transformed the country.



And now, Suri noted, universities are of a size and scale unimaginable even 60 years ago. The challenge is how, with all these changes, to ensure that the unique ethos and values of the past inform the future in innovative ways. “And you,” he told the APPA audience, “will have to figure out how to do this.” He listed a few of the issues:

**Improve public access.** The populist component of universities is that that they were designed to be accessible and open. “We forget this when we build walls around them.” We need to make campuses more public and accessible again—and not just for alumni and sports fans. An overwhelming problem is that there is no place to park. “That’s killing us,” Suri said. “We need people...If they can’t come onto campus, they don’t know what we are about...We should make the campus a frontier for everyone.”

**The challenge is how, with all these changes, to ensure that the unique ethos and values of the past inform the future in innovative ways.**

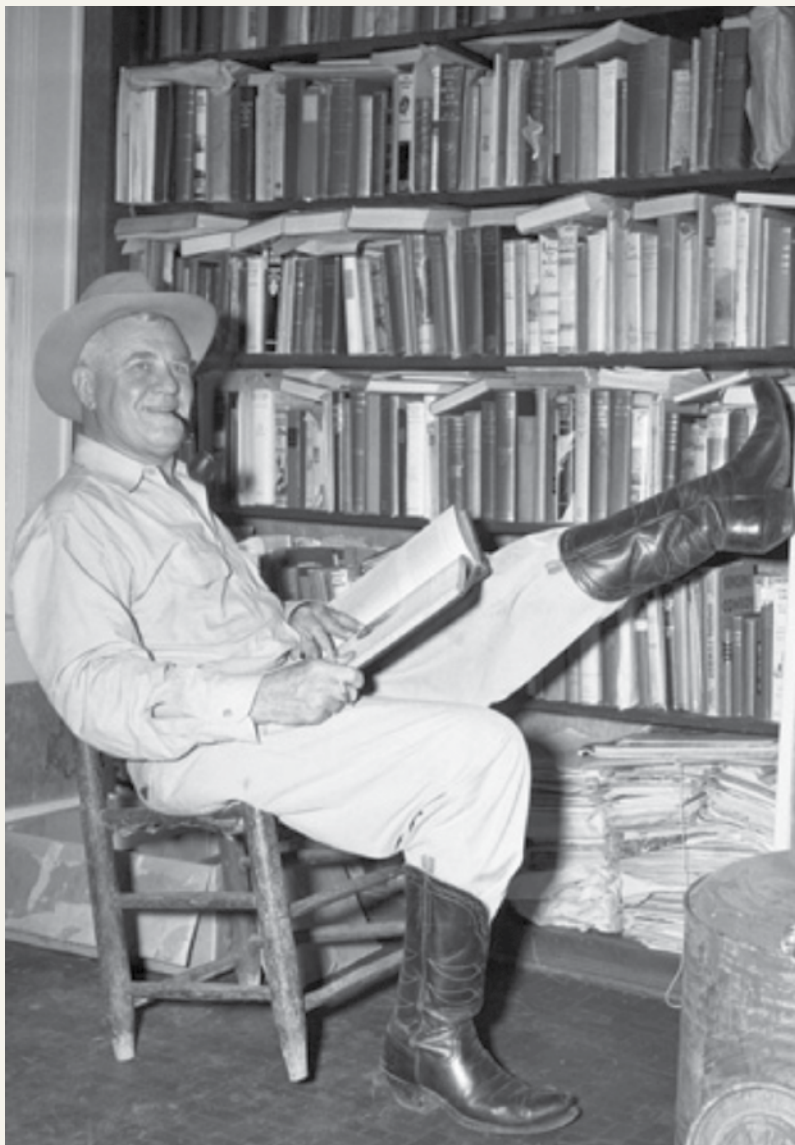
**Improve the research environment.** At the core of being populist and pragmatic is research. This is not just about isolated labs, Suri said, but about what the university does to bring things to others in society to make their lives better. “That, more than anything else, drives our economy,” he said. One example he gave of research that improves lives was that of Harry Steenbock, a professor and scientist at the University of Wisconsin-Madison. Until the 1920s, large numbers of American children died due to bone deficiencies from lack of vitamin D. But in 1923, Steenbock invented the process of using ultraviolet light to add vitamin D to milk and other products, thus almost single-handedly ending the scourge of rickets in our society.

After World War II, in addition to funding much scientific research, the federal government created centers at universities for research on international affairs. University centers produced new knowledge, language capacity, area studies, and leaders. “We need our campuses to encourage more research...by creating better research environments,” Suri said (another facilities challenge, he noted).

**Expand reach—and outreach—but retain community.** Universities have always been pragmatic, he said, training people to do real-world things, and they have been a place of higher thought

for purpose in society. Outreach has traditionally been important, including extension services, correspondence courses, and professional development. Distance learning is the latest addition to this list, though it poses great challenges. Although more students need to get educated than ever before, Suri stressed that they need to do this as part of a community. That community has to be reinvented, he admitted, but it still has to be community.

He also noted that the traditional residential model, which created community, also developed civility, something sadly lacking today. “You learn civility in an environment where you are forced to engage viewpoints you hotly disagree with, but with people you have to live with at the same time,” he said, “and people you come to respect even though you may not agree with them.” Both community and civility need to be



Pioneering citizens needed to be “settler intellectuals” to promote expansion and progress.



The modern campus today; UT Austin, right, and UW Madison, below.



renewed and reinforced, even if today there's less of the traditional residential experience, Suri said. He wants to see universities create all kinds of experiences for people outside the classroom—book discussions, speakers, things that bring people together—and to create spaces to encourage that.

#### COOL NEIGHBOR—AND CLOSED EMPIRE

In recent years, a paradox has emerged. On the one hand, the physical growth of universities means that, instead of being separate, on the outskirts of town, they are now embedded in

the city and infuse the city with their energy. Universities are part of contemporary urbanism. These are “knowledge cities...cool places to live,” Suri said, with knowledge workers who create spin-offs and with great entertainment and restaurants. People like to live in these cities that are “inordinately complex and messy in ways that are stimulating for all of us,” he said.

But on the other hand, the universities themselves have become victims of their own success. “Turner said we became democratic citizens because we left empire and had to pioneer a new space. Now, our huge universities are empires in their own right. Instead of a university sitting in a larger society, it's an empire closed off to a lot that goes on around it,” said Suri. “Though our connections to the public are deeper than ever, our central operating





principles are self-reflective, narcissistic, and focus on who we are. To be successful as a built environment, a research environment, and a teaching campus, we need to recreate the frontier, break down the silos, bureaucracy, and stratification. We need to create more spontaneity, more of the virtues of smallness, while being as being as big as we are."


Suri suggested that faculty and administration need to connect more. "We need to ensure that what is happening at universities is always experimental and spontaneous," he said. We can't be locked into old ways—a certain system for parking, a certain way to use buildings despite huge changes in technology or subjects. "We don't study history just to replay the past," he said, "but to think about alternative ways of doing what we do."

Institutions need to develop more public spaces, more spaces for faculty to interact with students and with peers, and even, if possible, less space given to private faculty offices. Suri admitted that the changes that are needed are more likely to be accepted if new hires in both faculty and administration deeply understand the mission of the university and are more amenable to these new approaches. "You will be the ones who will figure this out," he told the APPA audience.

#### MANAGING TO THE MISSION

The biggest need for APPA and its members, he said, is to train leaders who are not just technically competent, but who also understand the university's mission—what it's about. The people who manage day-to-day affairs must have this depth of understanding, not just the presidents. "Remember these values, find ways to achieve them effectively, focus on the few issues that will accomplish more, rather than trying to do everything," Suri said. "And make sure your bosses know you cannot do everything."

"American society will remain great if our universities continue to be frontiers for immigrants and strivers," he said. "Everything we do has to be about creating new frontiers." Very few people have a bird's-eye view of what the university is about. It falls to you to

create the environment; you have to integrate the faculty, labs, and classrooms to work together. "You will build the frontiers," Suri concluded. "You will build the pathways to them, and you will move people along them. I thank you for all you do." 

Anita Blumenthal is a freelance writer based in Potomac, MD. She can be reached at [anitablu@earthlink.net](mailto:anitablu@earthlink.net). View Suri's entire plenary session at [www.appa.org/appa\\_celebrates100years.cfm](http://www.appa.org/appa_celebrates100years.cfm).

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TACKLING CRITICAL FACILITIES ISSUES  
THROUGH THE

# *Hidden Power of Lean*

*(It's not what you might think)*



**H**ow can a Lean manufacturing approach help the educational facilities organization tackle their most daunting challenges? Let's start with a well-known Lean story.<sup>1</sup>

Years ago, the CEO of Ford Motor Company (Harold A. "Red" Poling) was envious of the great performance that Toyota was regularly achieving, and he wanted to understand why. Poling asked the head of Toyota's U.S. manufacturing operations for a tour of a Toyota plant. Toyota obliged, and Poling showed up with a team of people and spent hours inspecting the plant, only to leave disappointed. Why? They had not seen a super-automated factory, nor experienced any epiphanies to explain why Toyota was so successful. In fact, what they saw was the same equipment, systems, and engineering know-how that they had at Ford.

Why, then, was Toyota achieving greater success? Toyota's real competitive advantage was not related to expensive equipment or new manufacturing methods. It was what the Ford team could not see—Toyota's people and culture, deeply supported by its processes.

In other words, Ford did not see the transformational power of Lean.

#### WHAT DOES THIS HAVE TO DO WITH MY FACILITIES TEAM?

Like Ford, campus facilities leaders are facing many intractable challenges—deferred maintenance, reduced funding, rising costs, an aging workforce, broad energy and sustainability targets, and much more. As facilities leaders, we want to understand what best practices exist on other campuses, so that we can bring those great ideas back to our own campus and replicate them.

Unfortunately, looking to our peers for solutions doesn't always work, and we find that some practices that are successful at one campus are not at all successful at another. Why? The critical facilities issues facing most campuses are often not just *technical*, for which the problem is understood and can be solved with a "best-practice" solution.

Critical facilities issues can also be *adaptive* challenges, where we need to change our understanding, attitudes, or habits in order to truly understand the problems and innovate to develop solutions. For instance, replacing an air handling unit that has failed is a *technical* challenge that facilities departments already know how to tackle. In contrast, changing the approach and mindset of a facilities organization to reduce overall corrective maintenance costs and improve maintenance processes to avoid a failed air handling unit in the first place is an *adaptive* challenge.

This is where the hidden power of Lean can help.

#### WHAT IS LEAN?

Most of us have likely heard of Lean and are not surprised that this article started with a manufacturing story. However, the possibilities of Lean go far beyond the assembly line and operational process improvements. Most simply, Lean can be thought of as a way to deeply understand problems and then learn and work together—with leaders, managers, and boots-on-the-ground staff—to solve those problems. Lean asks us to relentlessly consider what our customers and stakeholders value and to show a deep respect for our people by engaging staff at all levels to come together and figure out how to deliver that value and remove the obstacles that are getting in the way. This is an ideal approach for both technical and complex adaptive problems.

There are many Lean tools and problem-solving techniques, but the fundamental power of Lean can be found in four elements: Purpose, People, Processes, and Performance—the "4Ps." Most people associate Lean with the third "P"—Process—but it is the linkages between all of the 4Ps where transformative change takes place. It is those linkages that separated Toyota from Ford, and it is those linkages that Ford couldn't see.





## HOW HAVE A FEW HIGHLY SUCCESSFUL FACILITIES TEAMS LEARNED TO HARNESS THE 4PS OF LEAN?

Let's hear from our peers:

### Case study #1: A large public institution with not enough resources

*How many of us are faced with doing more work with fewer people? That was the case at a public university on the West Coast. The facilities department was faced with an increasing number of projects amidst an already stressful, excessive workload. To top it off, the department lacked funding to increase capacity to match its project load. Along with those demands, staff and leadership needed to lower the cost and improve the timeliness of project delivery, improve customer experience ratings, and somehow create a healthier workplace with less stress. This required more than a best-practice technical solution; it was an adaptive challenge that needed a system-wide solution. So, the university decided to pursue a Lean approach.*

To tackle this challenge, the associate vice chancellor of capital programs brought together the entire department and its customers to understand the core purpose of the Capital Programs department and to assess honestly how it was performing to serve its customers (the *purpose* of their daily work). This was the beginning of the staff's Lean journey that has changed the perspectives, skills, and capacity of the organization. By understanding people's unique experiences, Capital Programs was able to see together where the biggest costs, time, and stress were occurring.

Staff identified six processes that, if improved, would have the largest impact on decreasing their workload and improving customer experience. As staff worked on the technical challenge of improving each process, they were also coached to learn a new way of thinking and acting to increase value, reduce waste, and respect people. This catalyzed more than *process* changes; they were connecting to *purpose* (what customers valued and the related strategy of the department), making *performance* visible (so they could see problems), and each one of the *people* involved was developing his or her ability to understand and tackle problems.

They also were able to see that the structure of the department was sometimes getting in the way. Instead of simply drawing a new organization chart, Lean thinking helped them design a structure so that roles were clear and processes flowed more smoothly (e.g., taking out approval bottlenecks). They have now begun to match peoples' capabilities and areas of satisfaction with their work assignments—and this also contributes to improving capacity.

As the department harnessed the hidden power of Lean, it achieved impressive results:

- 76% improvement in data accuracy of work orders
- 75% improvement in time needed to respond to customers about work order requests
- 23% improvement to the work order process
- 50% reduction in time for project initiation (from 3-4 days to 1-2 days)

There are additional benefits that are hard to quantify but just as valuable. As the staff continue on their Lean journey, they are experiencing transformational change in which people are addressing some of the most critical problems and alleviating many of the stress-inducing tensions on a daily basis. People have shared lessons such as, "I didn't realize how much occurred before the financial piece, and how many handoffs there are!" and "Process standardization is freeing up resources," and "This was a collaborative, gratifying process." In short, they are creating a healthier workplace *and* getting more done.

### Case Study #2: A large private university chipping away at deferred maintenance

*Some lucky institutions have been able to regularly increase the percentage of resources allocated to facility operations and capital renewal on an annual basis. More often, that level of funding is only enough to keep up, not enough to catch up.*

The Department of Facilities Management was limited financially in its ability to maintain and renew assets in a way that aligned with the department's mission and vision and provided better service to building occupants. At the same time, emergency and unplanned maintenance was on the rise, with 75 percent of all work orders spent on costly unplanned or corrective maintenance. Planned preventive maintenance (PM) was completed on time only 60 percent of the time. Making progress would require fundamental changes to the department's approach and mindset—an adaptive challenge. So, the university enlisted the Lean process to help.

The project goal was to identify ways of decreasing long-term capital renewal needs and daily operating costs by redirecting facility maintenance staff time from corrective maintenance to preventive maintenance. Using Lean thinking, and starting with the premise that the root causes of problems were not fully understood, the facilities staff set out to examine the current state of its systems and processes. The Lean funda-



mental of “respect” tells us that the people in the best position to deeply understand the current state of maintenance operations are the people closest to the work. As a result, the project team engaged 133 people including building occupants (their customers), tradespeople, supervisors, and management from Operations, Engineering, and Planning, Design & Construction to develop a new approach for their preventive maintenance strategy.

Spending time deeply understanding the current state led the university to two major process innovations. First, the team established a prioritization approach for maintaining different building portfolios and their associated assets. In doing so, they could focus on the work that would have the most impact with the least amount of difficulty. Second, the team identified major opportunities to improve maintenance work. The team went beyond an extensive review of work order processes (a common application of Lean) to add an explora-

tion together with the maintenance staff of how they operate on a daily basis.

By looking at processes and typical behaviors together, the team was able to find hidden resources in more than 55,000 hours of staff time that could be reallocated from activities that do not deliver value to their customers to processes that do. This was *not* asking them to work harder; rather, it helped remove daily frustrations (such as time spent waiting for parts) and made daily work more enjoyable. The previously hidden resources are now being redirected to preventive maintenance, as opposed to more costly corrective or emergency maintenance.

Like the public institution in Case Study #1, the university realized other important results that are hard to quantify, but best described by one of the trades staff: “We’ve had people... make recommendations, but this is the first time that anyone has asked us what we think.”

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# The **FOUR “P”s** of LEAN

## PURPOSE

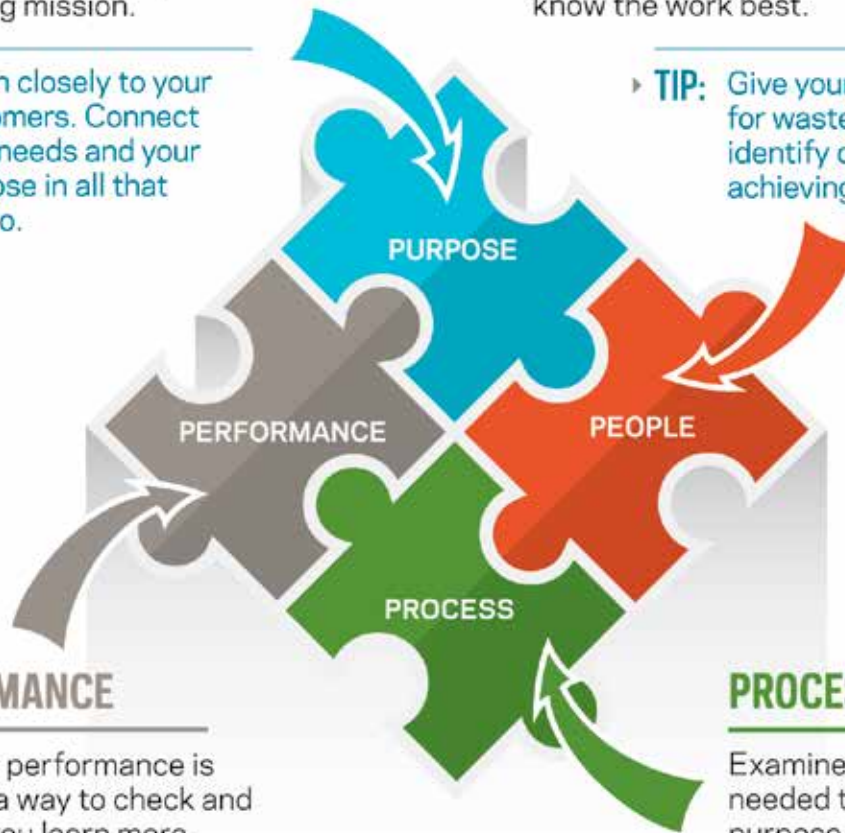
Connect daily work to your overarching mission.

- **TIP:** Listen closely to your customers. Connect their needs and your purpose in all that you do.

## PEOPLE

Engage the people who know the work best.

- **TIP:** Give your people “eyes for waste” so they can identify obstacles to achieving your purpose.



## PERFORMANCE

Measuring performance is critical as a way to check and adjust as you learn more.

- **TIP:** Make both positive and negative results easily visible to everyone.

## PROCESS

Examine what's truly needed to deliver your purpose, and seek to eliminate what is not.

- **TIP:** Expect time, effort, and iteration for continuous improvement.

### THE KEYS TO UNLOCKING THE HIDDEN POWER OF LEAN

These stories illustrate how the 4Ps of Lean help institutional leaders with vision and strategy, operational effectiveness, change management, and even professional development.

As institutions that apply Lean in facilities are learning, sustained change is achieved when each of the “Ps” work together. Lean helps teams to connect these four elements so that your own people can tackle critical issues and make things better for your customers along the way. This makes Lean far more than a “tool for better processes.” Rather, Lean becomes a systematic way to engage the extraordinary potential of your people to understand problems and innovate to find solutions that work best

for your culture and your challenges—and unlock the hidden power of Lean. 💡

### ENDNOTE

- 1 *Toyota Culture: The Heart and Soul of the Toyota Way*

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# **THE COSTS OF ADMINISTRATIVE SERVICE SYSTEMS VS. THE ACADEMIC MISSION**





## HIGHER EDUCATION INSTITUTIONS

need to minimize the costs of administrative systems in order to invest in their core missions. Here, seasoned Chief Information Officers talk candidly about three strategies: building-your-own in the modern era; buying and implementing in smarter ways; and joining a higher education consortium that shares processes and software.

In 2002, not even a decade into implementing enterprise resource planning (ERP) software, Robert V. Kvavik and Richard N. Katz estimated that higher education had spent around \$5 billion in this effort (“The Promise and Performance of Enterprise Systems for Higher Education,” *ECAR Research Study*, 2002). Some in campus information technology organizations may say: “Well, that’s not so much. We spend a lot more than that on facilities.” But let’s look at this figure from the perspective of how many full-year scholarships it represents at a typical public university: \$5 billion could provide 500,000 scholarships at \$10,000 each to students across the country. Given the financial pressures on students after a decade of tuition hikes, we would hope that everyone in higher ed would be determined to explore ways of avoiding such an expense so that the money could be put to better use.

We can only assume that higher education has likely spent another \$5 billion in the 12 years since the ECAR study with further implementations and maintenance. Many colleges and universities implemented commercial packages to address Y2K challenges to their legacy systems. These same institutions are now looking to upgrade the software or replace it with products from new providers. Some of these projects are budgeted at more than \$50 million at a single institution simply to upgrade what had already been installed. We believe it is appropriate, if not imperative, to ask a simple question: “Are there alternatives to spending another \$5 billion, particularly given the much greater cost pressures on higher education budgets today?”

This article does not present hypothetical arguments for one philosophy over another. These seasoned CIOs talk candidly about what they did with each of these alternative strategies: building-your-own in the modern era; buying and implementing in smarter ways; or joining a higher education consortium that shares processes and software. The hope is that together, these three viewpoints will stimulate a larger discussion around how to minimize the costs of administrative systems so that higher education institutions can invest in their core missions of teaching and learning, service, and research.





## UNIVERSITY OF IOWA: WE BUILT

*Steve Fleagle*

### WHERE DID YOU START WHEN YOU MADE YOUR LAST BIG ADMINISTRATIVE IT INVESTMENT?

Like many other large universities, the University of Iowa developed its student information system (SIS) using mainframe technology starting in the late 1960s. The components of the SIS were developed independently, both technically and functionally. At the time, there were no obvious connections between the various functional areas. Each of the primary areas—admissions, registration, and financial aid—was developed over the decades and resulted in complete, but somewhat isolated, applications.

By 2004, two things had become obvious. First, the independent nature of the various applications was becoming a barrier to meeting student and administrative needs. Second, the con-

straint that the technology placed on the applications—especially in terms of the ability to enhance, extend, and integrate—presented an even bigger barrier. It was clear that we needed better integration and a better platform to improve our efficiency and to provide an enhanced student experience.

### WHAT DID YOU DECIDE AND WHY?

When we began our evaluation process of new SIS options, the vendor landscape was full of uncertainty. We had significant questions about whether the systems on the market at the time would be able to be successfully implemented at the University of Iowa. Peers commented that after they had implemented their new SIS, they ended up several years behind in functionality from their previous systems. The functional offices were wary of taking steps backward in terms of their core business systems. Altogether, this didn't leave us with many good options for vended solutions.

In 2004, we went through the traditional RFP evaluation process and selected a commercial product. However, early on in the implementation, the functional and technical staff began expressing concerns about functionality, technical architecture, and scalability. After discussions with the vendor and implementation partners, we stopped our implementation project. Shortly

after that, the vendor announced that it was discontinuing development and was phasing out support for the product we had selected. Since we had just recently explored the market, we knew there weren't any other commercial or open-source products that would meet our needs. A few years earlier, we had implemented our own student portal and billing system. This had been successful in terms of functionality and resources consumed. With no other options, we decided we would take the same approach with the remaining SIS modules.

### WHERE ARE YOU HEADED?

Replacing the legacy system with an internally developed system was a six-year project with an out-of-pocket cost of \$3.2 million. This took longer than typical vended SIS implementations, but it was also much less expensive, since we used mostly internal resources and didn't have software licensing or ongoing maintenance costs.

With the new SIS, the Admissions Office was able to streamline its applicant processing to reduce the admissions decision time from two weeks to 48 hours

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for over 15,000 applicants. The office was also able to replace a commercial customer relationship management (CRM) and call center capabilities with integrated functionality. The savings and efficiencies exceed the licensing costs. Besides generating over 4.2 million e-mails and 360,000 letters, the call center team efficiency doubled, and the quality contacts for admitted student phone campaigns increased by 50 percent. The Registrar's Office implemented a paperless course drop/add process for the first week of classes. In the fall of 2013, more than 5,300 students electronically added over 8,000 and dropped over 8,800 courses, removing the need for advisor/instructor signatures while eliminating the long lines at the registration center. We also implemented an automated course waitlist process integrated with registration and electronic notifications, replacing instructor paper-based systems.

The integrated advising system provides a custom advising summary page, allowing advisors to review their entire caseload from a single screen and to track which advisees have registered or made enrollment changes. The updated degree audit is easier to read, and the audits are now triggered by enrollment changes so that students and advisors always have up-to-date information.

Overall, we are very pleased with the results of our new SIS. After trying to buy a commercial product, then exploring a shared solution, we've found that our build option has provided us with a cost-effective solution. However, that might not be true for all situations. Ten years later, the environment and also the options available are much different. I'm not sure that we would make the same decision today that we made in 2004.

Our strategy has been—and continues to be—to analyze each opportunity and make the best decision, considering all factors. We do not give strong preference to on-premise solutions, and also we are not a “cloud first” campus. We buy software and services when doing so is cost-effective and meets our needs; also we choose to develop our own systems when the total analysis determines that to be the best option. As cloud-based systems become more available and more cost-effective, we do see the trend moving in the direction of integrating best-of-breed systems. One of the great advantages of cloud services is their rapid deployment and provisioning. So when a cloud-based solution makes sense, we and many other institutions have found that the transition can be relatively rapid.

The IT environment, the role of information technology in higher education, and higher education itself are experiencing significant change. There are many solution choices, and the best options aren't always clear. This challenging situation is the one thing that probably won't change in the short term.



## UNIVERSITY OF MICHIGAN: WE BOUGHT

*Laura Patterson*

### WHERE DID YOU START WHEN YOU MADE YOUR LAST BIG ADMINISTRATIVE IT INVESTMENT?

In the late 1990s, the University of Michigan published an IT plan called “The Strategic Data Plan.” Based on input from hundreds of faculty and staff, the plan looked to the university's future and what was needed in its administrative systems. With the emergence of the Internet, the World Wide Web, and increasing competition for faculty, students, and research funding, the plan urged building a robust data infrastructure that would enable data-driven decisions and streamlined, end-to-end business processes. The vision described in the plan was to capture data at the source of creation and then share it across the university with those who had a need to access it to complete the university's business. The goals were for increased efficiency in business processes and a shared information infrastructure that enabled data-driven decision making.

At that time, the university had several student systems and multiple financial systems running on its three campuses. Shadow systems abounded and were considered the authoritative source of information for the university's critical business processes. Recognizing that building an information infrastructure to support all of the university's core business processes and delivering on the vision described in the plan would take a decade, the IT organization recommended considering a “buy” approach instead of a “build” approach. This was a bold move for a university that had built “in house” all the technologies in use at the time and that had little-to-no experience in negotiating for and deploying packaged software.

### WHAT DID YOU DECIDE AND WHY?

Responding to the university community's urgent requests for better information to guide decision making and for improved business practices to lower operating costs, we decided to move to an ERP system for the financial, human resource, and student administration systems. Furthermore, we opted for a single provider in order to make it easier to integrate the data from the three core business areas into a single data warehouse environment with a common set of reporting tools. We implemented more than 20 modules of software (including general ledger, purchasing, accounts receivable, accounts payable, asset manage-



ment, inventory, recruit and hire, human resource management, benefits administration, among others), a data warehouse, reporting tools, and Web-based self-service for students, employees, and staff in a three-year period, and spanned three campuses and the academic medical center, including the hospitals.

Since then, we have made additional university-wide investments in research administration and fundraising systems. Although we selected different vendors for those business processes, we were able to leverage the infrastructure and our earlier experiences in implementing the big three ERP systems. We deployed the same data warehouse environment and reporting tools for all systems. The engagement with the campus community for the transition from current to future state and the project management tools were the same, regardless of vendor, making the big, university-wide implementations more efficient and effective than if we had been starting from scratch, building the systems on our own.

Using the information we have about our administrative practices, over the past 12 years we have driven more than \$295 million of expenses out of our operations, far exceeding the cost of the software and its maintenance. The reduced operating costs have enabled us to keep tuition increases lower than would have been possible otherwise. The savings have been reinvested in financial aid and in the academic mission of the institution.

We stay current in the software that we run, allowing us to take advantage of new features and functions and to continuously improve our administrative practices. We are able to meet emerging, growing compliance requirements at minimal cost. In addition, the campus IT, purchasing, and legal departments have developed capabilities in software licensing, purchasing negotiations, data protection, and vendor exit strategies. These skills are critical for the next generation of technologies of cloud and at-scale computing, and our experience over the past ten years positions us well to make the transition.

#### WHERE ARE YOU HEADED?

The world is experiencing a paradigm shift toward technologies that are consumer-driven, social, mobile, and at-scale. The University of Michigan has launched a new IT strategy: Next-Gen Michigan. This strategy includes a “cloud-first” strategy, which means we will look first to the cloud for infrastructure, platform, and applications services. Our highest priorities are the technologies needed to advance the missions of teaching, research, and knowledge preservation in a global, engaged, at-scale world.

Higher education is in a period of disruptive change. Resources are shrinking while costs are increasing, the demand for accountability is high, campuses are global, and technology is driving new paradigms for research, teaching, and learning. The mission of the University of Michigan is to create and disseminate new knowledge and to prepare the leaders of tomorrow. When we can purchase and adopt existing proven products, we

will do so. We will invest our precious IT and intellectual capital in those things that do not yet exist—and especially in solutions that advance our core mission and allow our faculty to innovate.

Creating administrative software is not the purpose of our universities, and given the choice of building it ourselves or acquiring it from those whose mission *is* to develop business software, we believe it is best to look first to the market. We will continue to buy, but we will choose to build when doing so differentiates us from other markets, gives us competitive advantage, or enables us to maintain control of our intellectual capital.



Cornell University

## CORNELL UNIVERSITY: WE SHARED

*Ted Dodds*

#### WHERE DID YOU START WHEN YOU MADE YOUR LAST BIG ADMINISTRATIVE IT INVESTMENT?

What do you mean, start? We never stopped! Seriously, this is a tough question to answer because Cornell has made a series of big investments in administrative IT services over the course of many years. It seems unlikely that this trend will slow down anytime soon.

There is a certain irony and a tiny bit of frustration in this situation. Like most other CIOs in higher education, I believe that a big part of the CIO job is to allocate the largest possible portion of our limited IT resources to support core academic functions. Assuming a fixed pie, we are thus required to minimize expenditures on critical utility functions—such as administrative systems—while maintaining an appropriate quality for those services.

It's a delicate balance. Administrative systems are embedded in all of our operational processes. If they are not effective, everyone notices. Believe me. *Everyone* notices. Conversely, when they function correctly, people generally ignore them. Members of the campus community, who can shop and bank online, understandably believe that the university's information systems should work just as well, be as accessible, and be as easy to use as their services at home.

#### WHAT DID YOU DECIDE AND WHY?

Cornell has been affiliated with the Kuali Foundation since the earliest planning days of the Kuali Financial System (KFS). Recently, we joined a number of other schools in an effort to modernize and simplify the user interfaces of these systems,

especially those that are faculty-facing. We have a deep belief in the power of collaboration and sharing, and a longstanding tradition of working with other institutions toward common goals. Adopting the community-source approach is a natural step in the evolution of that tradition.

Cornell is a remarkably complex place. We are a private Ivy League institution that is also the land-grant university for the state of New York. In some sense that leads us to function as two companies with different needs for capital allocation, staff benefits, and so forth. We are geographically diverse as well: main campus in Ithaca; two campuses in New York City; a presence in Doha, Qatar; and a wide assortment of outposts across the state, country, and world.

As a consequence of this complexity, we not only share—we also buy and subscribe. Our purchased commercial systems are similar to those in use at many colleges and universities. They include Oracle's student system and contributor relations system and Blackboard's course management system. These systems have been in operation for many years. But our strategic direction is toward the cloud, where we are among the earlier adopters of Workday's human resource and payroll software-as-a-service (SaaS) offering. We launched this service in March 2013.

Each of these models—sharing, buying, subscribing—has its own set of advantages and disadvantages. One of the attributes of the SaaS or subscribing model is the maintenance model, which imposes a level of discipline that makes it impossible to fall behind on new software releases, a problem we have experienced with some of our other systems. But as we get used to the cycle of upgrades, we are building a repeatable process that will be absorbed into normal operations. This is a better model than the giant technical upgrades that have characterized the commercial ERP space for years. It also allows us to implement business practice improvements in a timely manner.

Across the many models, one constant remains: resource constraints. We have an extremely talented but relatively small staff who implement and support administrative systems. Whereas the expense of

software maintenance is a growing burden, the majority of the costs of any IT project relates to people, whether campus staff or external contractors. The common limiting denominator is fungible capacity, be it staff or capital.

#### WHERE ARE YOU HEADED?

We envision that over time, more administrative systems will shift to a cloud-based or externally hosted/supported model.



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Our experience thus far suggests that even though these models are not necessarily less expensive in dollar terms, proportionally less management time is needed to manage the accountability of an external service provider than to deliver the service itself. Accountability doesn't change. Offering a reliable and effective set of administrative software services is the responsibility of the CIO, no matter who or what company actually provides the service.

With our general strategy set out in the IT@Cornell Strategic Plan, our focus now is on executing and refining the strategy. A current development centers on demand management and coordination. Our Planning and Program Management (PPM) team is now acting as a single front-door to all administrative system requests. Working closely with our services division and campus stakeholders, PPM is rolling out a flexible demand-management approach that relies on "just enough" process to match the size and complexity of a given project.

As a part of these plans, one of the most important priorities for the Cornell IT community is to envision and reshape the skills of our wonderful staff. We have many excellent

## GOING FORWARD

We started this article by asking whether there are alternatives to spending another \$5 billion on ERP software and administrative services, particularly given the rising cost pressures constraining higher education budgets today. As the preceding viewpoints illustrate, the answer to that question is "yes." In fact, we have more than one option for addressing the cost challenges associated with enterprise/administrative systems. We have at least three: build-your-own; buy smart; share processes and software. But each has its advantages and its disadvantages, which IT leaders will need to evaluate in light of their institution's strategy, resources, and priorities.

How the software and services are acquired is not the strategic issue. The key is what leaders *do* with the software and services. The actual cost matters less than the value that an institution can drive out of the investment made. Leaders must work to change business processes, establish strategic contracts for purchasing, provide self-service, and redesign service offerings. This is the only way that administrative service systems—whether built, bought, or shared—bring value.

As we seek to improve the way we do our work in our colleges and universities, we can learn a lot from each other and can avoid repeating the same mistakes or re-creating the same wheels. Together, we can find ways—including the best way for an individual institution—to reduce the costs of administrative service systems, thereby allowing more resources to be applied to the core academic mission of higher education. ☞

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College Park; he is also a past at-large member of APPA's Board of Directors. Steve Fleagle ([steve-fleagle@uiowa.edu](mailto:steve-fleagle@uiowa.edu)) is the chief information officer and an associate vice president at the University of Iowa in Iowa City. Laura Patterson is the associate vice president for information technology security services and administrative information services at the University of Michigan in Ann Arbor. Ted Dodds ([ted56@cornell.edu](mailto:ted56@cornell.edu)) is chief information officer and vice president for information technologies at Cornell University, Ithaca, NY. This is the first article for each in *Facilities Manager*.

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## AND SO, AS USUAL, AFTER WE HAVE CONSIDERED ALL THE PIECES AND PARTS OF THE WIDE-RANGING TOPIC OF ADMINISTRATIVE SYSTEMS, IT ALL COMES DOWN TO PEOPLE.

people who have abundant skills that they apply in service to the university every day. With the IT industry changing more quickly than ever before, the skills that make our organizations successful today may be different from the skills that will be needed tomorrow. We are currently conducting an inventory of individual staff members' IT skills so as to develop a database of who has which skills and where they are located across the university. In concert with this inventory, we are engaging campus IT leaders to develop a vision of the skills they will need in three to five years. Those two pieces will allow us to chart a path toward the development of appropriate, and sometimes new, skills for providing IT services at Cornell.

And so, as usual, after we have considered all the pieces and parts of the wide-ranging topic of administrative systems, it all comes down to people.

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# Who Are These People?

By Joe Whitefield

Here are two questions worthy of your consideration: 1) are you engaged in any professional or personal relationships that are frustrating or challenging? 2) If so, do you view the people in these relationships as objects or people? Don't answer yet; just think about it.

I was confronted with these questions recently as part of a leadership session at APPA's Senior Facilities Officer Summit. The session was based on the book *Leadership and Self-Deception* by the Arbinger Institute. My initial response was that of course I have some challenging relationships, and that I think of all people as people, not objects. However, the more I learned about the second question, the less confident I became of my answer. Before you answer for yourself, let's explore the topic a little.

## PEOPLE AS OBJECTS

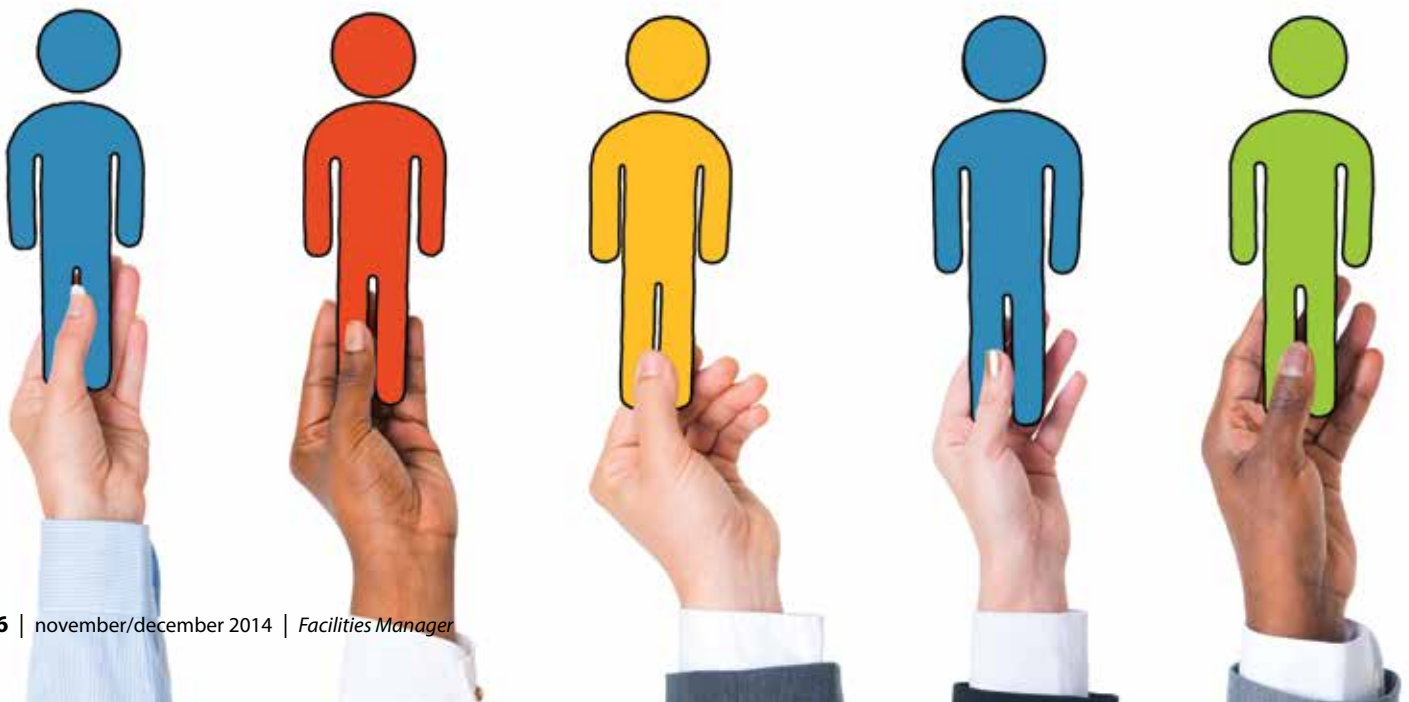
Chairs are objects. They have many uses. You can sit on them, sometimes stand on them (not advised), and so on. In each case the chair serves a specific purpose or need that we may have. Basically they can be **tools**. In some cases chairs can also be **obstacles** if they are setting in our way, impeding our movement in a space. Finally they can simply be **irrelevant**—present, but neither useful nor specifically in the way.

To think of a person as an object is simply to think of him or her as either a tool (to be used to meet an objective of yours), an obstacle (impeding the accomplishment of an objective of yours), or irrelevant. The book refers to thinking of people this way as “being in the box.”

## PEOPLE AS PEOPLE

People are people. They have needs, desires, schedules, objectives, and agendas. Seeing others as people basically means that we recognize they are responding to the situations and motivations in their lives just as we do. This is being “out of the box.” Using this perspective is profoundly important—as challenging as it may be with certain people. So ask yourself; do others count as much as you count?

Think of the person on the road, bypassing the patient drivers, who wants to cut in front of you just as his lane ends. How do you view that driver? As a person or object? He is certainly impeding your progress. Whether you let him in or not, he is still a person who is trying to get somewhere. The fact that you are on the same road, going the same direc-



tion, at the same time suggests you have some things in common. Now you have two decisions to make; will you let him in (behavioral) and will you consider him as a person or object (paradigm).

It turns out this simple consideration of others as people is the key to healthier, more productive relationships. It affects our behaviors toward others and, equally if not more importantly, it affects the receptivity of our behaviors by others. We know when people are faking it with us. It is hard to do our best work when we feel underappreciated or are suspicious of the other person's motives. No matter how much they smile and nod, when we sense that we are just an object to them the work, and intended results, suffer. And if we can recognize this in others, you must know they can recognize the same in us.

Not surprisingly, when one person views the other as an object, it often results in a reciprocating view by the other person. The health and effectiveness of this type of relationship can be described in varying degrees of mediocre, poor, or toxic.

#### RESETTING RELATIONSHIPS

So, let's assume you have at least one relationship that could be better. What do you do? Maybe you've tried to be nicer, more attentive, a better listener. As good as those efforts are, they are still behavioral changes. Behavioral changes can fall flat, or invite counterproductive responses when they are viewed skeptically (because you are still in the box and the other person feels like an object.) Your actions will not be trusted.

To really change the relationship you should start with getting out of the box—seeing the other person as a person. Try to understand his or her needs, motives, and objectives. Look to be as supportive of others as they are to you. Make no mistake, people can have profound differences in convictions, opinions, personalities, and consideration of appropriate behaviors. Seeing another person as a person does not

mean that you have to accept his or her views or compromise yours. It simply means that the other person still counts, and that should be the basis from which behaviors and communications derive. With some persistence and a little luck, they may even reciprocate and get out of the box for you

There is really a lot more to the

discussion than can be presented in this space. So, I recommend you read the book. In the meantime, I have a few relationships to which I need to tend. ☎

Joe Whitefield is executive director of facilities services at Middle Tennessee University, Murfreesboro, TN. He can be reached at [joe.whitefield@mtsu.edu](mailto:joe.whitefield@mtsu.edu).

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- Michigan State Univ
  - 50 showers





# Seeing Eye-to-Eye on I-Codes

By Dana Peterson and Sam Waymire

September saw the formation of APPA's I-Codes Work Group which will monitor, assess, and ultimately influence the relevant activities of the International Codes Council (ICC). This is an exciting development and marks the first time that APPA members will have the opportunity to collaborate and propose changes to codes and standards promulgated by the ICC. International codes (often shortened to I-Codes) are model codes published by the ICC that are suitable for easy adoption by states or municipalities.

Organized under the leadership of the APPA Standards and Codes Council

(ASCC), the Work Group seeks to propose changes and formally recommend new language for the International Building Code and other "Group A Codes" that are now up for public review.

It is the goal of the Work Group to offer recommendations reflecting broad consensus among APPA members, and that directly support the activities of the higher education sector. The Work Group will also promote I-Code awareness among APPA's member institutions, serving as a venue wherein members can learn more about the impact of both pending and existing ICC standards and codes.

The I-Codes Work Group held its Inaugural Convener's meeting on September 30 and got off to a productive start. Conducted via Web-conference, this meeting attracted attendance from a wide range of highly qualified professionals that were eager to share their hard-earned industry knowledge. The primary purpose of this initial gathering was to encourage participants to consider the compliance challenges that educational institutions might encounter through the implementation of the I-Codes that are slated for review in 2015. From there, the Work Group will seek to determine how to allocate its

time and resources to ensure that the needs of APPA members are best addressed. Preliminary ideas for proposed I-Codes changes were solicited from meeting participants and will act as a foundation upon which the Group will further develop its plans.

Though the Work Group is presently charged with addressing codes under the 2015 group of revisions, its scope may easily be expanded to address ICC code issues on a more continuous basis, especially given the cyclical nature of the ICC review schedule. During the inaugural meeting there was a clear interest in developing the Work Group to function in this direction. Participants seemed eager to offer their expertise on an ongoing basis as the Work Group's first foray into the ICC standards and codes space for 2015 becomes successful. In short, we could see the ASCC expand the scope of the I-Codes Work Group, or create separate Work Groups to address member comments and recommendations pertaining to ICC's Group B Codes, as well as the International Green Construction Code (IgCC).

The Group A Codes that are up for review in 2015, and are within the scope and framework of the APPA I-Codes Work Group's activities, are as follows.

- International Building Code® (IBC®)
- International Existing Building Code® (IEBC®)
- International Fuel Gas Code® (IFGC®)
- International Mechanical Code® (IMC®)
- International Plumbing Code® (IPC®)
- International Property Maintenance Code® (IPMC®)
- International Private Sewage Disposal Code® (IPSDC®)
- International Residential Code® (IRC®)
- International Swimming Pool and Spa Code® (ISPSC®)
- International Zoning Code® (IZC®)

The I-Codes Work Group is now developing a list of active members from a diverse array of institutions, including professionals with backgrounds in four-year and two-year higher education institutions and K-12 schools. APPA Emeritus members and business partners with expertise in the Group A I-Codes may also express their interest to participate in the Work Group. In doing so, APPA can be sure that the full voice of its membership rings through clearly, and that each code or standard issue can be considered from a healthy range of perspectives.

With momentum building, the I-Codes Work Group is poised to affect meaningful change in the codes under

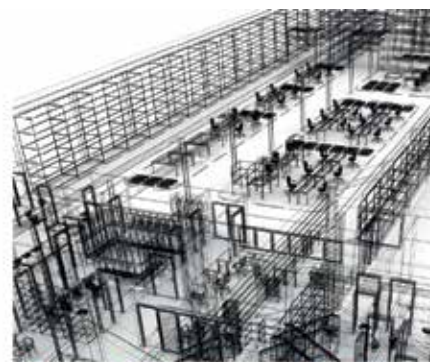
its purview. The formation of this work group represents a major step towards guaranteeing that *all* APPA members will have a seat at the table wherever and whenever standards and codes impacting the education sector are developed and discussed. ☎

Dana Peterson is a member of the APPA Standards and Codes Council (ASCC) and serves as the chair of the ASCC I-Codes Work Group. He is the associate architect for the University of New Hampshire. Sam Waymire is the administrator of the APPA Standards and Codes Council. This is his first article for *Facilities Manager*.

To learn more about the I-Code Work Group's activities and to participate in the Work Group, contact Dana Peterson at [dana.peterson@unh.edu](mailto:dana.peterson@unh.edu) or Sam Waymire at [swaymire@appa.org](mailto:swaymire@appa.org).



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# Creating BIM Value with Lean

By Kimberley Maul and Andrew Deschenes

The current Architecture Engineering and Construction (AEC) industry trend of incorporating Lean practices and construction techniques is a natural and welcome fit to enhance the building information modeling (BIM) experience for facility professionals.

Lean construction techniques and processes such as the Last Planner System and Target Value Design have received a lot of press in the past decade, but there are other processes that can help leverage your team's knowledge to solve problems before they happen. A good example of this is using Conditions of

Satisfaction, Work Flow Mapping, and Reflections to develop a BIM that continues to work long after the construction project is over.

Often, the incompatibility of technology and data systems makes easy accessibility to frontline facilities and maintenance staff cumbersome and difficult. Even owners who want to tap into the operations and maintenance benefits of BIM files and data have been reluctant to do so because the information is hard to understand and use.

However, recent advances in technology—specifically cloud computing and

mobile devices—have brought the long-awaited benefits of post-construction BIM into view. Yet to fully attain these benefits and advance as an industry, it's important to determine what solutions can help complete the circle. We must consider long-term operations and look at the best way to integrate workflows and technologies. This is where Lean steps in. It's great to use this new technology, but it's even more important for it to generate value.

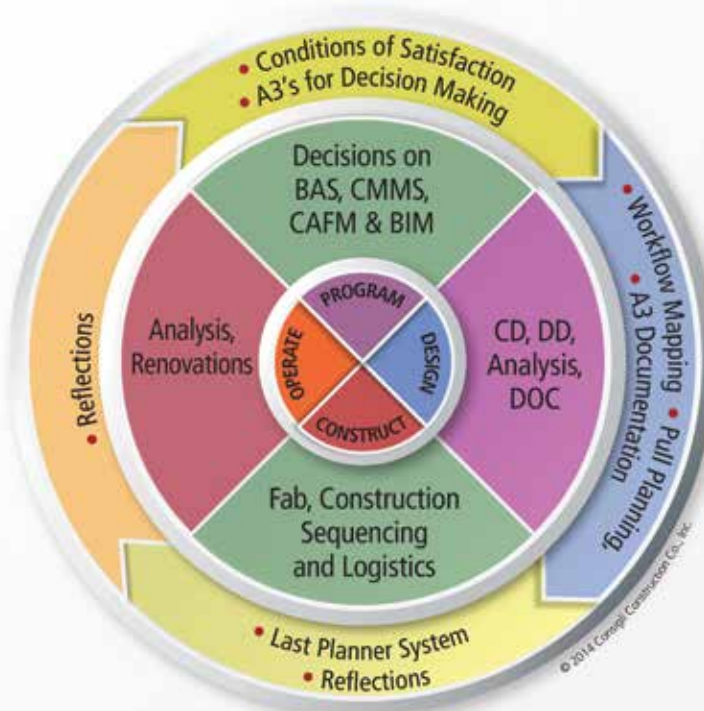
## DEVELOPING THE BEST SOLUTION

So how is it done? First the AEC team needs to understand how the facility is already managed, or is going to be managed after construction is complete, in order to develop the best FM solution for that facility.

From there, using a Lean process called Conditions of Satisfaction, guidelines are produced by the whole team to agree on and document what they consider will make the project a success. Coming together early and clearly understanding what is of value to the owner is vital. Guidelines produced through this process become the basis for a BIM Execution Plan (BEP) for the project—essentially the road map for BIM goals, workflows and use. At the start of the design, when owner-defined information is embedded into the modeling process, it can be carried through the entire BIM project cycle.

After the Conditions of Satisfaction are established, it's time to use Lean processes to develop a plan for the best way to generate transparency and common understanding.

## BIM and Lean Integration in Building Lifecycle



These Lean processes can consist of collaborative Pull Planning sessions to develop and understand workflows and bring in stakeholders early in the planning process. This ensures things are done correctly the first time and eliminates rework. Using Reflections allows the team to review how well the plan is working to ensure the project is on track to meet the Conditions of Satisfaction.

A collaborative approach with BIM use has also proven to be very successful—it's the most effective way to use this tool. Establishing a "Big Room" where the entire AEC team can co-locate daily creates efficiencies and boosts communication. We've also seen more BIM teaching/learning happen in collaborative settings when people with different experiences using the same tool work together.

For example, Boston Public Library's Johnson Building Improvements project, which integrated new façade components and program areas within a contin-


ually operating public building, used the collaborative Pull Planning process to find solutions to design changes in less than 24 hours and complete the MEP BIM coordination two weeks faster than the original 8-week schedule.

Finally, as teams work more closely, a greater trust in model fidelity is developed, and the reuse of models increases as they move downstream.

#### THE KEY TO SUCCESS

Efficiencies gained from using a Lean approach have eliminated the need for owners to populate databases after turn over. This approach has also given them the ability to use BIM beyond the construction phase to bidirectionally sync data between FM software and Revit to keep as-maintained documents, or create a custom FM solution. It is important to note, however, that even as the technology improves, it is still human behavior that continues to be the key to larger

successes. We have seen that the best teams employ the following strategies:

- Early involvement by the owner with their facilities and other user groups
- The creation or strengthening of company standards and protocols
- Clear definitions and goals provided to the design and construction teams for every phase of the project, especially post-occupancy
- A commitment by all involved to break bad habits, suppress egos, and reinforce collaborative, supportive behavior. 

Kimberley Maul is Lean coordinator at Consigli Construction Co., Inc., Portland, ME, and can be reached at [kmaul@consigli.com](mailto:kmaul@consigli.com). Andrew Deschenes is director of project services at Consigli and can be reached at [adeschenes@consigli.com](mailto:adeschenes@consigli.com). This is their first article for *Facilities Manager*.

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# At the Helm of APPA's Body of Knowledge (BOK)

By Anita Dosik

**A**PPA's Body of Knowledge (BOK) is available to all members online, as a searchable, digital database. The BOK develops, updates, and disseminates the foundational content required by facilities professionals at colleges, universities, schools, museums, and other nonprofit, educational organizations to do their jobs. The BOK is ongoing, and updated sections are posted as soon as they are peer reviewed and approved for publication.

It takes many volunteers to keep APPA's BOK up-to-date, relevant, and informative. At the helm, is the editor-in-chief, APPA Fellow Maggie Kinnaman, as well as four content coordinators, who, working with the authors, editorial board, peer reviewers, and APPA staff, make the BOK a reality.

At this time we are pleased to announce a new content coordinator, Steve Maruszewski, for Part 4 (Planning, Design, and Construction.) We welcome Steve and look forward to the many contributions he will be making to the continued success of APPA's BOK. Steve will take over from Don Guckert, who was the PDC content coordinator for the past year and a half.

Here is a current listing of the BOK chapters and their authors, along with information about the content coordinators in charge of each part.

## PART 1, GENERAL ADMINISTRATION AND MANAGEMENT



**Jack Hug, APPA Fellow**  
Hug Consulting and  
Management Services  
Colorado Springs, CO

Jack has been active professionally during the past 52 years, working in facilities management and university administration; he's also a past APPA President. Jack has served as assistant vice chancellor for the University of California, San Diego from 1984 until his retirement in April 2002. During this time he has served as director of UCSD's Physical Plant

Services for the main campus located in La Jolla, California, and for the UCSD Medical Center located in San Diego.

Prior to working at UCSD, Jack served as chief facilities officer at several other institutions of higher education including major research universities, and large, medium, and small institutions, within both public and private sectors.

Jack offers consulting services on facilities management, organizational performance management, and a variety of offerings for specific facility management service support departments. In his role as president of Hug Consulting and Management Services, Jack serves as the principal consultant and performs

organizational reviews and service performance assessments based on criteria and scope customized to meet an institution's specific area of interest and need.

### Chapters in Part 1 of the BOK:

- **Building an Effective Workforce**  
*By Anita Zimmerman and John De Souza*
- **Change Management**  
*By John Morris, P.E., CEFP*
- **Communication**  
*By Robert Hascall and Karen M. Salisbury*
- **Financial Analysis and Control**  
*By Mohammad Qayoumi, Ph.D.*
- **Leadership**  
*By William Daigneau, APPA Fellow*
- **Managing Ethically**  
*By E. Lander Medlin*
- **Modern Budgeting Issues**  
*By William Gardiner*
- **Organization**  
*By Jack Hug, APPA Fellow*
- **Overview of Accounting Systems**  
*By Burr Millsap*
- **Staff Development**  
*By Suzanne Hilleman, MBA, SPHR*
- **Strategic Role of Human Resources**  
*By Andrea Balestrieri*
- **Strategy and Leadership**  
*By Brenda Albright*

## PART 2 – OPERATIONS AND MAINTENANCE



**Gary L. Reynolds, P.E.,  
APPA Fellow**  
University of Colorado –  
Colorado Springs  
Executive Director of Facilities  
Services

Gary has a BS and MS in Mechanical engineering from Iowa State University and has 33 years' experience in higher education facilities at several large state institutions and a small private institution. He has been a member of APPA since 1981 and been involved in various positions in APPA, including MAPPA President and APPA President. He is currently a faculty member of the Institute for Facilities Management and a

past member of the Leadership Academy. He is currently co-director of the Center for Facilities Research, which was created during his presidency. He is an editor of a book published on quality management by APPA and author of numerous articles in *Facilities Manager* magazine.

### **Chapters in Part 2 of the BOK:**

- **Building Architectural and Structural Systems**  
*By Steven Thweatt*
- **Building Control Systems**  
*By Gary Reynolds, APPA Fellow*
- **Building Electrical Systems**  
*By Mike Anthony*
- **Building Fire Protection**  
*By John DeLaHunt, MBA, ARM*
- **Building Interiors**  
*By Jean Sebben*
- **Building Mechanical Systems**  
*By Gary Reynolds, APPA Fellow*
- **Campus Security**  
*By Christopher Blake*
- **Capital Renewal and Deferred Maintenance**  
*By Harvey Kaiser*
- **Custodial Services**  
*By Alan Bigger, APPA Fellow*
- **Elevator Systems**  
*By Jay Popp*
- **Emergency Preparedness and Business Continuity**  
*By John DeLaHunt, MBA, ARM*
- **Environmental Health and Safety**  
*By Ralph Allen*

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- **Facilities Condition Assessment**  
*By Harvey Kaiser*
- **Facilities Maintenance and Operations**  
*By Gary Reynolds, APPA Fellow*
- **Grounds Maintenance and Operations**  
*By John Lawter, EFP and Rob Doletzky and Chad Godfrey and Bruce Morrison*
- **Recapitalization Management**  
*By Douglas Christensen, APPA Fellow*
- **Solid Waste and Recycling**  
*By Phillip Melnick*
- **Work Management**  
*By Mark Webb, EFP*

### PART 3 – ENERGY, UTILITIES, AND ENVIRONMENTAL STEWARDSHIP



**Darryl K. Boyce, P.Eng., FASHRAE**  
Carleton University  
Assistant Vice President of Facility Management and Planning  
ASHRAE Vice President

Darryl began his university career as a mechanical designer at the University of Alberta in 1974. In 1978, he left his full-time position to attend university full-time to earn a B.S. in mechanical engineering. During this time, he also worked part-time as a mechanical designer in the Department of Physical Plant.

Upon graduating in 1982, he returned to full-time employment as a senior energy analyst. In 1986, he assumed the position of manager of energy services at the University of Western Ontario, served in various roles at the university, and was promoted to the position of associate director of physical plant (Facilities Engineering and Construction).

In 1998, Darryl became director of physical plant at Carleton University and now holds the position of assistant vice president (Facilities Management and Planning).

He completed the mechanical engineering technology program at the British Columbia Institute of Technology in 1973 and received a Bachelor of Science in mechanical engineering from the University of Alberta in 1982.

As vice president of ASHRAE, Darryl is a member of the Board of Directors and the Executive Committee and serves as chair of the Publishing and Education Council.

#### Chapters in Part 3 of the BOK:

- **Campus Utility Systems Master Planning**  
*By John Tysseling, Ph.D. and Darryl Boyce*
- **Central Heating Plants**  
*By Antoine D'Amour and Richard Forget*
- **Central Monitoring and Control Systems**  
*By Carl Ruth*
- **Cooling Systems and Thermal Energy Storage**  
*By Kent Peterson, P.E., LEED AP*
- **Data and Voice Network Infrastructure**  
*By Denis Levesque and Mike Milne*
- **Domestic and Fire Protection Water Supply and Distribution Systems**  
*By Susanne Cordery-Cotter, P.E. and Carol Dollard, P.E., CWP, LEED AP*
- **Electrical Distribution Systems**  
*By Aravind Batra*
- **Energy Generation Alternatives**  
*By Donald Schmidt, Ph.D., P.E. and Darryl Boyce*

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## Body of Knowledge

[www.appa.org/bok](http://www.appa.org/bok)

- **Energy Management and Conservation**  
*By Reza Karkia*
- **Energy Supply Alternatives**  
*By Pete Sandberg*
- **Primary Fuel Management**  
*By Cheryl L. Gomez and Warren W. Weeks*
- **Roadmap for Campus Environmental Sustainability**  
*By Jiri Skopek, OAA, MCIP*
- **Sanitary Sewers and Storm Water Management Systems**  
*By John McEwan*

### PART 4 – PLANNING, DESIGN, AND CONSTRUCTION



**Steven Maruszewski, P.E., CFP, LEED AP**  
Pennsylvania State University  
Assistant Vice President for Physical Plant

Steve is currently the assistant vice president for physical plant at Penn State. Steve began his career there in February 1995. He jointly oversees a workforce of over 1,300 professional, technical service, and administrative employees. His responsibilities have also included leading the university's Environmental Stewardship Strategy, co-chairing the university's Sustainability

Strategic Planning process and leading the efforts associated with defining and managing the campus deferred maintenance and capital renewal needs. Steve started his career working as a consulting engineer for major architectural engineering firms, and just prior to joining Penn State, was a managing principal in two multi-discipline consulting engineering firms.

Steve is a Penn State graduate from the architectural engineering program, and in 2010 was honored by the Architectural Engineering Department by being named a Centennial Fellow.

#### Chapters in Part 4 of the BOK:

- **The Building Commissioning Process**  
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- **Building Information Modeling**  
By Jim Jacobi
- **Capital Budgeting**  
By Alan Matthews and Diane Cook
- **Construction Management**  
By Jeffrey Gee
- **Design Management**  
By Michael Haggans
- **Infrastructure Planning**  
By Frederick Mayer and William Daigneau, APPA Fellow
- **In-house Design/Construction Services**  
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By Robert E. Kitamura and Joseph E. Bilotta and Linda Dalton and Michael Multari
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By Ira Fink
- **Project Delivery**  
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By Jeffrey Lipton

- **Renovations**  
By Mark Thaler
- **Site Development**  
By Joseph A. Hibbard
- **Space Planning and Administration**  
By Joseph E. Bilotta

- **Sustainable Design and Construction**  
By Andrew S. McBride
- **Value Management**  
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# A Fantastic Week of Learning

By Corey Newman

**A**PPA U, held September 7–11, 2014 in Orlando, Florida, showcased another successful professional development gathering of the Institute for Facilities Management and the Leadership Academy. Colleagues from around the globe were welcomed to learn, network, and collaborate.

We are very grateful for the dedicated faculty who make these offerings such a success. A special note of thanks goes to

Institute Deans: **Mary Vosevich, Jay Klingel, Lynne Finn, and Don Guckert**; and our Academy Faculty: **Glenn Smith, Al Stoverink, Chuck Farnsworth, Shawna Rowley, Matt Adams, Viron Lynch, Doug Christensen, Ana Theimer, and Randy Ledbetter**.

Throughout the week, students had opportunities to interact with experts who brought their knowledge and experiences from vast backgrounds and provided a rich environment for all attendees. Almost 400 facilities professionals from across North

America and Lebanon attended and we welcomed 64 first-time attendees, proving that APPA's popularity in the profession continues to grow.

As the week drew to a close, we celebrated with graduation ceremonies for the class of September 2014 (including 70 new alumni). A big thanks to all those institutional leaders who supported the professional development of their staff. The professional development of any individual must be as customizable as the individuals themselves—and APPA is here to help everyone achieve their personal, organizational, and institutional goals.

Please visit [www.appa.org](http://www.appa.org) for more on all of APPA's program offerings. ☎

Corey Newman is APPA's associate director of professional development and can be reached at [corey@appa.org](mailto:corey@appa.org). This is his first article for *Facilities Manager*.



« Academy Graduates

Institute Graduates »



PHOTOS BY RHONDA HOLE

## Academy Graduates

*In alphabetical order; not all graduates are pictured.*

Sheila Barger, *Miami University*  
Mark Behrens, *University of Maryland/Baltimore*  
Jeffrey Bull, *University of Maryland/Baltimore*  
Joseph Emory, *University of North Carolina/Chapel Hill*  
Kathy Fukuyama, *Portland Community College*  
Mark Goska, *University of Alabama/Birmingham*  
Buddy Hale, *University of North Carolina/Greensboro*  
Frank Harris, *Portland Community College*  
Katherine Hines, *University of Georgia*  
Sylvester Johnson, *Tulane University*  
Christine Langlois, *East Stroudsburg University*  
Ray M. Maag, *Brigham Young University/Utah*  
Joseph Martinez, *The College of William and Mary*

Jeff McConnell, *Middle Tennessee State University*  
Kevin McGlinchey, *University of Oregon*  
Sandra Mohr, *Miami University*  
Ron Peters, *University of Nebraska/Lincoln*  
Zainudeen I. Popoola, *University of Nebraska/Lincoln*  
Tyrone Quarles, *University of Alabama/Birmingham*  
Ravi Seth, *University of Alabama/Huntsville*  
Ricardo Torres, *El Paso Community College*  
Edward von Bleichert, *University of Colorado/Boulder*  
Deborah Weinerth, *Washington & Lee University*  
Kelly Wilson, *Columbus State University*  
Judith Witter, *University of Michigan/Ann Arbor*

## Institute Graduates

*In alphabetical order; not all graduates are pictured.*

Tim W. Aldridge, *University of North Georgia*  
Robert J. Avalue, *The College of William and Mary*  
Beverly D. Beaver, *Virginia Commonwealth University*  
Shellie Black, *Iowa State University*  
Bridget Blizzard, *University of Texas/Austin*  
David Brinegar, *Brebeuf Jesuit Preparatory School*  
William J. Bussman, *Texas Women's University*  
Shelly Carpenter, *University of Michigan/Ann Arbor*  
Sam Crispin, *Colorado School of Mines*  
Agnes S. Donaldson, *University of Pennsylvania*  
Arthur Frazier, *Spelman College*  
Steve Fryman, *Florida State University*  
Tyrone Gangoo, *Centennial College*  
Darrell Garbacik, *Culver Academies*  
Steven Gilsdorf, *Western Michigan University*  
Thomas Goodhew, *University of Colorado/Boulder*  
Arnold Hernandez, *Illinois State University*  
Craig Hickey, *University of New Brunswick/Fredericton*  
David Jongebreur, *University of Georgia*  
Edwin M. Lehman, *Eastern Mennonite University*  
Douglas P. Litwiller, *University of Iowa*  
Shaun McCready, *University of Virginia*  
Carl McLaughlin, *University of Michigan/Ann Arbor*

Rebecca Mitchell, *Mt. San Antonio College*  
Walter Molishus, *University of Pennsylvania/Philadelphia*  
Robert Morikawa, *University of Michigan/Ann Arbor*  
Jimmy Muniz, *University of Colorado/Colorado Springs*  
Calvin Nesbit, *Winston-Salem State University*  
Jimmy L. Nifong, *Wake Forest University*  
Scott Perelstein, *Northern Arizona University*  
William J. Pierce, *Appalachian State University*  
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Brian Stanford, *Virginia Polytechnic Institute & State University/Student Centers and Activities*  
Terri Thompson, *California State University/Fullerton*  
Derek K. Thornton, *Saint Mary's College/Maryland*  
Fermin Torrez, *Texas State University/San Marcos*  
Kelly Trayah, *Middlebury College*  
Jason Veitch, *Lakeland College/Canada*  
Jelena Vulovic-Basic, *Centennial College*  
Richard A. Watts, *University of Alabama/Birmingham*  
Anna Welscott, *Colorado School of Mines*  
Frederick Willison, *Texas Women's University*  
Chris Ziolkowski, *Embry-Riddle Aeronautical University*





Book Review Editor: Theodore J. Weidner, Ph.D., P.E., CFP, AIA

## As the calendar year draws to a close there are two books

reviewed here that could be on a wish list for next year's reading. Both can help address personal and organizational needs for operational effectiveness.

My wish list includes a challenge to anyone in this readership to contribute a book review. This column is open to contributions. Happy New Year!

### EFFECTIVE AND INNOVATIVE PRACTICES FOR THE STRATEGIC FACILITIES MANAGER

Jeri Ripley King, editor, APPA, Alexandria, VA, 2014, 137 pp., Softcover \$57, \$42 (member).

The typical book on facilities management often focuses on the wide range of technical and non-technical issues that face a facilities manager on a daily basis. Occasionally, the author will cover strategic planning issues that focus on physical growth or improvements in customer service.

*Effective and Innovative Practices* is a compilation of articles/chapters from APPA members and others. All are experts in the topics addressed.

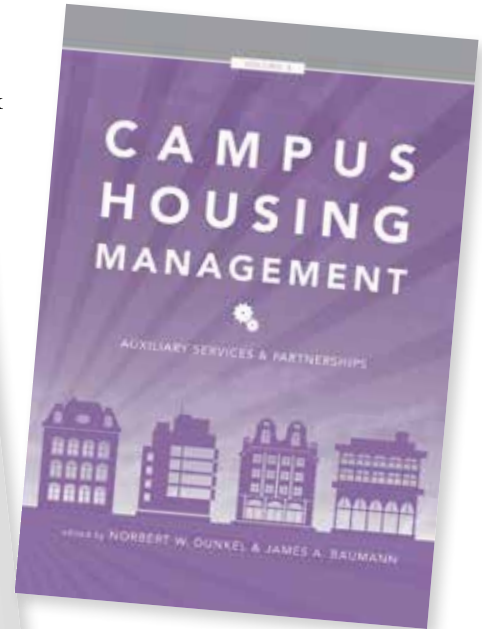
Organized along the lines of the Strategic Assessment Model, the combination of authors outline the creation and implementation of tools that can be used to operate a facility management organization intelligently and creatively. It may seem a redundant argument to approach the topic and concepts, but it actually makes a great deal of sense. Defining of the foundation for effective tools and then developing the techniques with measurement and assessment is an extremely logical approach.

All contributors to *Effective and Innovative Practices* contribute valuable and helpful information in a clear and organized way. Despite the caution in the preface, the overall flow from chapter to chapter is logical and fairly smooth given the many contributors and stylistic nuances. One area I would have liked to



see a little more of is a discussion about different levels of data needed to truly understand the organization and how one might acquire that data in a cost-effective/non-duplicative way. Facility officers have so many different things to manage and so many customers with opinions and ideas, that effective data acquisition is extremely important in finding their next innovation.

*Effective and Innovative Practices* is an excellent way to increase one's knowledge to take the next, strategic step, in the management of your organization. Make the effort for your next strategic step, part of any new year's resolutions, and acquire this book; you'll benefit from it.



### CAMPUS HOUSING MANAGEMENT: AUXILIARY SERVICES AND PARTNERSHIPS

Norbert W. Dunkel and James A. Baumann, editors, ACUHO-I, Columbus, OH, 2013, 142 pp., Hardcover \$49.99.

Every now and then a simple inquiry leads to another opportunity to learn and share knowledge from outside the immediate APPA family with one of APPA's strategic partners. Such is the case with *Campus Housing Management: Auxiliary Services and Partnerships*, volume five of a six-volume set published by the Association of College and University Officers-International (ACUHO-I). Thanks to Teri Bump from American Campus Communities for sharing this volume with and actually taking the time to hand-deliver it while traveling from conference to conference speaking engagements this summer.

The six-volume set of *Campus Housing Management* is the ACUHO-I equivalent of APPA's Body of Knowledge.

The other volumes cover most other areas of housing in a college or university setting where the field has grown beyond a simple room and board model. In Volume Five specific topics of Greek housing, family and graduate housing, food service operations, camp and conference operations, and public-private partnerships and related housing models are presented in five individual chapters written by campus and (in the case of the last chapter) private experts.


Volume Five, which focuses mostly on physical operations, is one of the more appropriate volumes for a facility officer. Each chapter provides some background on the subject, but the bulk of each presents good discussion of different delivery models within the subject area and how each model meets customer desires.

Within the overall housing focus is plenty of material that is useful for the

facility manager: what the customer wants, different ways to meet customer desires, and operational factors such as sustainability, renovation, business cases, and staffing. While some campuses may not have Greek housing or a public-private partnership (P3) arrangement, it is useful to understand the financial or operational structure for them. It could well be the case that Greek housing is disappearing while P3 housing is growing, as colleges and universities respond to societal and financial demands.

From a facility perspective, it's important to understand the different pressures of our colleagues on the housing side of the campus. For smaller campuses, it's easier to experience those pressures because housing may be part of the business side of the campus; larger institutions may only interact with housing through a capital construction project or when a

renovation or repair is too large for the housing staff. Regardless, understanding of one's customers, and their different challenges and opportunities helps the entire organization work well.

One of the biggest customers of facilities services is the housing department. Every facility officer should be interested in gaining a deeper understanding of their current problems and possibilities for growth. I recommend this volume of *Campus Housing Management*, it will help you with a very large campus customer. 

---

Ted Weidner is an associate professor at Purdue University and consults on facilities management issues primarily for educational organizations. He can be reached at [tjweidne@purdue.edu](mailto:tjweidne@purdue.edu). If you would like to write a book review, please contact Ted directly.

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**Alertus Technologies**, LLC launches The Alertus mobile dispatcher app allowing authorized dispatchers to send preset alerts as well as view or cancel active alerts. Launching an alert via the mobile app can also activate notification alerts through other, integrated products—including the Alert Beacon, Alert Desktop Notification, LED marquee display, text-to-speech interface for public address and giant outdoor speaker systems, fire alarm interface, VoIP phone alerting, and digital signage and cable television over-



ride. The Alertus mobile recipient app notifies targeted students, faculty, and personnel when an emergency alert has been activated. For further information on Alertus Technologies products visit [www.alertus.com](http://www.alertus.com).

**SnowWolf's** Ultra Series blades deliver a cutting-edge experience when it comes to efficient and cost-effective snow removal. The innovative plows save time and money by eliminating windrows and the need for additional passes. Ultra Series blades come in five widths ranging from 6' to 10' and attach easily to small or large skidsteers and utility loaders that range from 4,000 to 14,000 lbs. With the 35-degree plowing angle and tight mold-board curvature, snow rolls off of these blades unlike anything

else on the market, and they save fuel because they require less horsepower to push. In addition, the blades can oscillate up to 6" to adjust to the contours of plowing surfaces and evenly wear the cutting edges. For further information on SnowWolf product's visit [www.snowwolfplows.com](http://www.snowwolfplows.com).

**ZON** introduces Powersol an outdoor solar powered charging station for student electronic devices. Built on a standard 9' high quality patio umbrella, the Powersol has 8 securely fitted solar sleeves that generate electricity to charge a unique charging hub using a rechargeable lithium ion battery. The charging hub has three smart-sensing USB ports that can charge student devices as quickly as a regular wall socket. Anywhere a campus has a patio umbrella a Powersol can be used. Students can enjoy the convenience of charging their devices while outside studying or socializing. For more information regarding ZON, visit [www.zon-technology.com](http://www.zon-technology.com).



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history, has been elevated to the realm of fine art in everyday architectural decoration. Dunbar is known for the highest standard of design and craftsmanship. For additional information, visit Dunbar Stained Glass at [www.dunbarstainedglass.com](http://www.dunbarstainedglass.com).





many other electrical parameters on single and three-phase systems. The PowerScout 3037 is equipped with several key new features, including a USB port for quick setup, and an optional display for diagnostics and reading real-time values. For greater information on Dent Instruments, please visit [www.DENTinstruments.com](http://www.DENTinstruments.com).

**DENT Instruments** announced the introduction of the all-new PowerScout 3037 revenue-grade networked power meter. The PowerScout 3037, which replaces all models of the PowerScout 3 Plus, monitors voltage, current, power, energy, and

New Products listings are provided by the manufacturers and suppliers and selected by the editors for variety and innovation. For more information or to submit a New Products listing, e-mail Gerry Van Treeck at [gvtgvt@earthlink.net](mailto:gvtgvt@earthlink.net).

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# LEVERAGING FACILITIES FOR INSTITUTIONAL SUCCESS

## PART 2



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## Section IV: Facilities' contributions to institutional goals

### Using facilities to advance institutional priorities

Facilities are more than the stage on which higher education performs. The entire built environment plays a role—often a greater role than members of the academic community realize.

Both facilities themselves and the facilities operation can help institutions achieve their goals and reach optimal outcomes.

**Student success: Facilities create environments that support learning and enable new teaching methods.** Faculty and students pay little attention to classroom space—until it stops working. In fact, sophisticated facilities planning and design can help institutions improve student engagement by supporting evolving teaching methods, including flipped classrooms and problem-based learning. Rooms that allow for the instructor to move around the room easily and enable quick rearrangement of desks to form small groups encourage the teaching styles shown to be most successful for today's students. Planners and architects are looking for cost-effective ways to transform old-fashioned, theater-style lecture halls into spaces that can adapt along with the pedagogy.

**High rates of recruitment and retention: The campus plays a major role in creating positive impressions and building student engagement.** When alumni tell stories of their college or university years, they often mention the places—the quad, the cafeteria, the dorm—that shaped their memories. The significance of these places begins the first time students visit an institution; in a survey by APPA of more than 16,000 students at 46 institutions, 50 percent of respondents agreed with the statement, “When I first saw the campus, I knew this was the right college for me.” Two-

thirds of respondents claimed the overall quality of campus facilities and the attractiveness of the campus were either “very important” or “essential,” and nearly a third of respondents rejected a particular college or university because it lacked facilities they considered important. The campus—the actual, physical campus—is critical to the student experience, and successful institutions will find investment here pays off.

### Data Point: Recruiting and the campus *Sending a message*

“We must understand that campus landscapes are a medium of communication. The landscape is continually sending messages to students, faculty, and staff; is it saying what you want it to?”

—Phil Waite, associate professor of landscape architecture and environmental planning, Utah State University, “Campus Landscaping: Impact on Recruitment and Retention,” Society for College and University Planning Webinar, May 7, 2014.

**Affordable tuition and fees: Efficient facilities operations can significantly reduce costs for the institution.** Best practices in facilities management can increase the overall operating efficiency of the institution, especially when total cost of ownership is adopted as a policy. Total Cost of Ownership (TCO) considers not just up-front costs of buildings and systems but also long-term costs to operate, maintain, upgrade, and replace them. Typically, institutions track these expenses separately, dividing them between capital improvement, maintenance, and recapitalization funds, a practice that costs the institution more over time. TCO provides a data-driven approach that helps colleges and universities

**Data Point:**

Optimal outcomes for higher education	Actual outcomes today	Barriers to success	Strategies for bridging the gap	Facilities' contributions to success
Student success	Inconsistent educational outcomes	Inflexible and entrenched teaching methods	Increase emphasis on student success	Facilities create environments that support learning and enable new teaching methods
		Underprepared students		
		Changing demographics		
High rates of recruiting and retention	Poor recruitment and retention	Ineffective retention strategies		The campus plays a major role in creating positive impressions and building student engagement
Affordable tuition and fees	Limited access and lack of affordability	The arms race	Improve affordability	Efficient facilities operations can significantly reduce costs for the institution
Financially sustainable business plan	Unsustainable funding model	Aversion to risk		
		Declining resources		
Responsible use of space and other resources	Poor use of space and other resources	Outdated space policies	Allocate resources based on institutional priorities	Effective space management makes the most of the institution's single-greatest sunk cost
			Increase reliance on data and business analytics to support decisions	
Clear mission and focus	Lack of focus and unclear mission	Unclear, unaligned mission	Focus on the mission of the institution	Strategic master planning enables the built environment to support the institution's mission
		Changing expectations		
Environmentally sustainable campus	Failure to prioritize environmental sustainability	Multiple challenges and issues distracting from sustainability efforts	Prioritize environmental sustainability	The campus is the single-greatest opportunity for improving institutional sustainability



understand and manage their facilities investments while providing a model for sustainable business operations to the entire institution.

**Responsible use of space and other resources: Effective space management makes the most of the institution's single-greatest sunk cost.** Colleges and universities are increasingly recognizing the value of their space—and how space has, until now, been squandered. Institutions that fail to responsibly manage their space spend more to operate and maintain their facilities and pour more into new construction. Best practices for space management include aligning space management to the mission of the institution; changing the culture of space so it is perceived as a valuable and shared resource; developing effective policies, processes, and organizational structures to manage space; and implementing a space inventory system to understand resources and identify needs.

**Clear mission and focus: Strategic facilities planning enables the built environment to support the institution's mission.** Facilities need to be aligned with the mission of the college or university through a strategic facilities master plan. Plans include assessment of current facilities and their use along with an analysis of trends facing the campus. (For example, is enrollment expected to rise or decline? By how much?) Then planners engage with the college or university's mission and translate general statements into concrete plans for buildings and grounds. For example, an institution focused on teaching and learning might invest in technology-equipped classrooms. A school capitalizing on its reputation as a tight-knit community and seeking to improve student engagement might build new residence halls. A campus seeking to improve recruiting could strive to improve the first impression the campus makes on visitors. Creative thinking can identify smart ways to fulfill the institution's goal in brick and mortar.

### **Data Point: Smart space management**

#### ***Aligning space metrics with capital improvement funding***

The University System of Georgia (USG) recently completed a major project to create a common data set of space metrics for use across the entire 31-campus system. The project was motivated by “the belief that improved efficiency in space use represents a significant strategic advantage to the system” and “because of dissatisfaction with traditional space use approaches which have had limited success in helpfully informing either master planning activity or capital allocations.”

Better data for capital improvement planning was a major priority of the project. The new system seeks to allow for better comparison of space utilization and productivity between USG institutions, identify deficiencies that could be corrected with reallocation or repurposing of space, determine which capital improvement projects are most necessary, and establish priorities among projects that receive funding.

Among the metrics developed were the classroom metric, which measures classroom size and utilization and identifies both empty seats in a classroom and times when the room itself is vacant. Two other critical metrics are the office metric, which compares employee counts to office station counts, and the social/study metric, which measures the contribution of “soft” spaces such as reading and study rooms, lounges, computer labs, and tutoring rooms.

USG believes the new approach will enable the institution to get more out of their space. The authors of the report describe the program as “the first step towards a better physical environment for learning and research in the state . . . [that] makes a vital contribution to the future of higher education in Georgia.”

—*Final Report: USG Space Utilization Initiative,*  
July 2013.

**Data Point:**

Issue	Current attitude/ approach	Problems with this attitude/approach	Transformation needed	Desired educational outcomes
Facilities operating costs	A never-ending burden on the institution, and a growing liability.	Goal becomes minimizing operating costs, not optimizing facilities operations	Investments in maintenance and operations are seen as vital to the mission	<ul style="list-style-type: none"> <li>• Affordable tuition and fees</li> <li>• Financially sustainable business plan</li> </ul>
Facility renewal	Continued deferral. a growing liability	Leads to an ever-increasing spiral of costs. Diminishes the value of facility investments	Reduction in the renewal backlog. Eliminate redundant facilities and adopt of alternative funding mechanisms	<ul style="list-style-type: none"> <li>• Student success.</li> <li>• High rates of recruiting and retention</li> <li>• Responsible use of space and other resources</li> </ul>
Life-cycle costs and total cost of ownership (TCO)	Costs of buildings and systems only considered up-front	Facilities and systems are costly to operate and maintain	Life-cycle costing and TCO implemented for every capital investment decision	<ul style="list-style-type: none"> <li>• Affordable tuition and fees</li> <li>• Financially sustainable business plan</li> <li>• Responsible use of space and other resources</li> </ul>
Space	Cost of space to the institution is unknown to users; space is controlled by departments and programs	Inefficient use of space—some space is wasted and underutilized while other space is over capacity	Space is managed as an institutional asset. Costs are communicated and sometimes shared. Value of investments in space are maximized	<ul style="list-style-type: none"> <li>• Responsible use of space and other resources</li> <li>• Affordable tuition and fees.</li> <li>• Financially sustainable business plan</li> </ul>
Outsourcing	In-house staffing is preferred for almost all operations	Rising labor costs; limited labor pool; aging workforce; distraction of attention from primary mission	Services and operations are outsourced when another organization may be able to do the job better for less	<ul style="list-style-type: none"> <li>• Clear mission and focus</li> <li>• Affordable tuition and fees.</li> <li>• Financially sustainable business plan</li> </ul>
Technology	Focused on instruction and research; lack of investment in operational analytics	Lack of automation of business processes, increasing administrative burden; lack of data for decision making	Data is tracked and analyzed by business analytics systems. Systems are integrated and widely accessible	<ul style="list-style-type: none"> <li>• Affordable tuition and fees</li> <li>• Financially sustainable business plan</li> </ul>
Financial management system	Legacy systems are hard to access; primarily useful for audit record	Limited information available to administrators to manage budgets and control costs	An integrated financial system that allows for better forecasting and management	<ul style="list-style-type: none"> <li>• Affordable tuition and fees</li> <li>• Financially sustainable business plan</li> <li>• Responsible use of space and other resources</li> </ul>

**Environmentally sustainable campus:** The campus provides the single-greatest opportunity for improving institutional sustainability. The college or university campus generates up to 90 percent of an institution's carbon footprint. Institutions will only become truly sustainable when their built environments are sustainable. Colleges and universities have made enormous

### **Data Point:** **Facilities and institutional costs**

#### ***The high price of old buildings***

Older buildings may add charm to a college campus, but they also add costs. According to one, a facilities consulting firm, for buildings between 25 and 50 years old, work orders average \$2.35 per square foot, nearly double the \$1.40 per square foot for buildings under ten years old. (For buildings older than 50, the cost is \$2.20 per square foot.) Maintenance backlogs are also higher for older buildings: \$110 backlog per gross square foot for buildings between 25 and 50 years old and \$160 for buildings older than 50. The backlog for buildings ten years old or less is \$20.

Rutgers University plans to demolish numerous old and inefficient buildings and is targeting small structures, which are often disproportionately expensive to heat and cool. The university will remove about 120,000 square feet scattered among old houses, buildings, and trailers and replace them with a new, 175,000-square-foot building that will include new classrooms. The move will save the institution \$1.6 million per year in maintenance, custodial services, and energy costs.

"The biggest cost savings at colleges and universities today is in reducing their footprint," says Antonio Calcado, vice president of facilities and capital planning at Rutgers. "Especially at larger colleges and universities, the footprint has just gotten so large, and it costs so much per square foot to just maintain that space."

—Excerpted from Scott Carlson, "Less is More: Campus Officials Trim Square Feet to Cut Costs," *The Chronicle of Higher Education*, March 10, 2014.

strides in sustainability. Leadership in Energy & Environmental Design (LEED) certification is now routine for new buildings, and Green Globes and other programs are being used as well. Higher education energy consumption dropped at an average rate of almost 14 percent between 2008 and 2012. However, challenges remain, especially for existing buildings, which cost far more to operate and maintain than newer buildings. Facilities departments with a strong commitment to sustainable design and operations must continue to explore creative ways to conserve energy, recycle materials, and cut carbon emissions.

### **Transforming the facilities organization to meet institutional goals**

For the built environment to significantly advance the goals of colleges and universities, both the institution and the facilities organization will need to change their thinking. Facilities must be seen in a more strategic light.

Campus leaders must see that the facilities organization is engaged with the institution's mission and goals. Senior facilities officers must be included in top-level discussions of trends, issues, and challenges facing the campus, and their ideas and suggestions must be welcomed. At the same time, the facilities organization needs to take its role seriously. It needs to broaden its vision and increase its visibility within the institution.

Transformation is necessary in the following operational areas to allow facilities to make the greatest possible contribution to the mission of its institution.



## Section V: Facilities' strategies for improving institutional outcomes

### How the critical issues were identified

The premise of the Thought Leaders symposium is that facilities leaders have much to contribute to the major challenges facing higher education. Five top issues were identified by participants on leveraging campus facility assets to achieve institutional goals. Also identified were critical questions for institutional dialogue. The questions are the heart of the exercise: They are intended to guide facilities managers and university leaders in the discussions at their own institutions. A major goal of the Thought Leaders Series is to help individual colleges and universities assess where they stand and help them develop strategies for the future.

### 1. Understand how facilities affect student success and employ best practices for student recruitment and retention.

**The issue:** Facilities organizations can significantly contribute to student success through better use of buildings and grounds.

#### Strategies for success:

Facilities influence student success more than most administrators realize. Leading institutions recognize the value of the built environment in attracting, retaining, and teaching students; they invest in making their campus more student-friendly.

The first step is to identify the goals and shortcomings of the institution. Where are students best being served? Where are they faltering? Is recruitment down or up? What about retention? Is the college or university shifting its teaching methods? Are problem-based classrooms and team learning replacing traditional lectures?

Answering these questions can point facilities departments in the right direction to improve student success. For example, a community college might identify retention as a problem. Research shows that increasing student engagement on campus can help improve retention. Facilities can help increase engagement by expanding the number of casual spaces for student interaction, such as lobbies, lounges, and courtyards. The institution can create warm, welcoming places with good seating, lots of light, and Wi-Fi. (Don't forget to add extra electrical outlets; students are often looking for workspaces where they can also charge laptops or phones.) Investing in casual spaces can be a critical step in increasing student interaction and engagement.

Facilities organizations should also identify aspects of the campus that detract from the mission and goals. Consider the message different facilities are sending. Is a crowded, run-down residence hall sending the signal, "We don't care about your experience here?" Are classrooms with outdated instructional systems diluting the institution's image as a leader in advanced technology?

Finally, organizations need to communicate the value of facilities to the rest of the institution. Many constituencies don't appreciate how much facilities can accomplish. Consider conducting a quick survey with potential students after campus visits asking their impression of the buildings and grounds, or survey students in a variety of different classrooms about their experience. (Could you partner with a statistics, communications, or architecture class to develop and administer the survey, making it a learning experience?) Develop usage metrics that are tied to institutional goals and show how you're targeting these priorities.

Data Point:

Optimal outcomes for higher education	Actual outcomes today	Barriers to success	Strategies for bridging the gap	Facilities contributions to success	Facilities strategies for improving institutional outcomes
Student success	Inconsistent educational outcomes	Inflexible and entrenched teaching methods	Increase emphasis on student success	Facilities create environments that support learning and enable new teaching methods	Understand how facilities affect student success and employ best practices for student recruitment and retention
		Underprepared students			
		Changing demographics			
High rates of recruiting and retention	Poor recruitment and retention	Ineffective retention strategies		The campus plays a major role in creating positive impressions and building student engagement	
Affordable tuition and fees	Limited access and lack of affordability	The arms race	Improve affordability	Efficient facilities operations can significantly reduce costs for the institution	Use total cost of ownership as a guiding principle for all facilities decisions
		Aversion to risk			
Financially sustainable business plan	Unsustainable funding model	Declining resources			
		Rising costs			
Responsible use of space and other resources	Poor use of space and other resources	Outdated space policies	Allocate resources based on institutional priorities	Smart space management makes the most of the institution's single-greatest sunk cost	Make better use of campus space
			Increase reliance on data and business analytics to support decisions		Expand data collection and analysis to cut costs and increase efficiency
Clear mission and focus	Lack of focus and unclear mission	Unclear, unaligned mission	Focus on the mission of the institution	Strategic master planning enables the built environment to support the institution's mission	Use the campus as a classroom to expand awareness of sustainability and facilities best practices
		Changing expectations			
Environmentally sustainable campus	Failure to prioritize environmental sustainability	Multiple challenges and issues distracting from sustainability efforts	Prioritize environmental sustainability	The campus provides the single-greatest opportunity for improving institutional sustainability	

**Questions for institutional dialogue:**

- What elements of the built environment contribute to students selecting this institution? To continuing through graduation? To learning and succeeding?
- Does the facilities department have a mechanism (such as facilities master planning) for aligning institutional trends, mission, and goals with the built environment? Is this process effective?
- Which specific campus goals can be best supported by facilities? Where can facilities make the most cost-effective investments to further these goals?
- Which facilities or aspects of the facilities operation are detracting from institutional goals?
- What metrics can you put in place to better measure the role of facilities? How can you better communi-

cate the value of the built environment? What sort of data would influence senior administrators to back investment in facilities strategies to advance the goals of the college or university?

**2. Use total cost of ownership as a guiding principle for all facilities decisions.**

**The issue:** Employing TCO enables facilities to make the smartest investments in buildings and systems.

**Strategies for success:**

Discussion about the costs of facilities is usually divided into the same two categories that show up on balance sheets: initial construction costs and maintenance and operations costs. What's missing is an understanding that the two costs are related. In fact, facilities can cost twice as much to maintain and renew as they do to build. TCO takes this fundamental fact into account by calculating and communicating the lifetime costs of a facility.

TCO also promotes wise spending that will maximize the value of the investment. The cheapest air conditioning system may look good on the capital improvements budget, but if it costs twice as much to operate, it's not a source of savings. The same goes for the low-cost industrial carpeting that has to be replaced three times more often than its slightly more expensive rival. TCO provides a mechanism for weighing up-front and long-term costs.

Implementing TCO requires commitment from senior administrators and even state support for public institutions. Budgeting policies and procedures must be adapted to allow TCO to work properly. Campuses need to examine what changes would be necessary at their institution to employ TCO. What stands in the way of implementing the process? What sort of support will be needed and from whom? How can the facilities organization achieve buy-in?

TCO has significant sustainability implications and can help institutions maximize their investments in green buildings and systems. Generally, sustainable

**Data Point:****Student success through classroom design*****Design considerations for effective learning spaces***

- **Design learning spaces around people.** Keep the focus on the interaction between students and teachers. Don't let technology dictate classroom design.
- **Support multiple types of learning activities.** Design the classroom to support discussion, experiential learning, and project-based activities as well as traditional lectures.
- **Make space flexible.** Allow spaces to be quickly reconfigured, and design the space to be easily renovated as new technology and pedagogy changes.
- **Design for comfort and functionality.** Allow plenty of surface space for laptops and storage space for backpacks and bags. Use windows to bring in natural light, but make it easy to block the light for on-screen presentations.

—Adapted from Diana Oblinger, “Leading the Transition from Classrooms to Learning Spaces,” *An NLII White Paper*, National Learning Infrastructure Initiative and EDUCAUSE, October 2004.



building practices incorporate some form of TCO, but applying rigorous life-cycle cost analysis can help ensure new high efficiency systems don't have hidden maintenance or replacement costs that will diminish their impact.

Finally, TCO supports hard decisions, like the choice to demolish rather than maintain outdated buildings. Institutions can end up devoting a major portion of their budget to old facilities that aren't worth maintaining. Sometimes, buildings cost more to operate—usually barely limping along—than they would cost to tear down and build anew. Pouring money into a failing building is a classic case of throwing good money after bad and an example of ways institutions sabotage themselves.

### Questions for institutional dialogue:

- What benefits would TCO offer the institution? Can the facilities organization make a business case for this strategy? Are there examples on campus where TCO would have made a difference in long-term costs?
- Does the institution currently track the life-cycle costs of buildings and systems? Are there measures in place to align capital spending with maintenance and renewal?
- What processes and policies would need to change to implement TCO? Who is responsible for those processes and policies? Who would you need to convince that change is necessary?
- What sort of data would be needed to implement TCO? Is that data available today? What would be necessary to start collecting, distributing, and analyzing that data?
- Do sustainability initiatives on campus include aspects of TCO? How could facilities and sustainability staff combine efforts to make TCO effective for both units?
- Is the institution spending too much maintaining outdated or unneeded buildings? How can you make the case for replacement or demolition?

### Data Point:

#### Facilities and institutional costs

#### *The high price of old buildings*

"TCO is the best tool for [colleges and universities] to use to reduce overall maintenance costs and capital costs. It will help them to make better decisions about overall asset management. In general, higher ed over-maintains buildings. You could have replaced them three times for what you were spending to maintain them."

—Doug Christensen, president of Christensen Facilities Group, LLC, quoted in Apryl Motley, "The Total Package," *Business Officer Magazine*, November 1, 2013.

### 3. Make better use of campus space.

**The issue:** Colleges and universities can cut costs and improve efficiency by maximizing the use of their space.

#### Strategies for success:

Underutilized space is a wasted resource, and any classroom or lab that sits vacant for half a normal class day is wasted. Colleges and universities should be finding every opportunity to maximize the use of resources, and that means taking seriously the problem of space.

At the heart of the issue is the question, "Who controls space?" Traditionally, individual departments or programs controlled how space was allocated and assigned. They were under no obligation to share space with other units and fought hard to keep what was "theirs" even if they no longer needed it. Many decisions were made automatically, so departments assigned large offices to senior faculty members, even if those faculty had joint appointments and ended up with multiple offices. Space was free, as far as departments were concerned. Light, heat, and plumbing for these spaces didn't come out of their budgets, so it didn't matter if the room sat vacant year-round—it wasn't costing them anything.

Colleges and universities are starting to renegotiate space with departments and programs. Recognizing that space is a shared resource, they seek to schedule classes

and assign offices fairly across the entire institution. On some campuses, the institution, not the department, now controls space, and decisions are made by a central space planning office. Other colleges and universities keep some space, or some level of control, at the department level, but have policies that prevent the most wasteful space practices.

Scheduling, for example, presents many opportunities for improvement. Keeping all departments on the same block schedule and spreading courses throughout the day allows the institution to maximize its classroom usage. (While traditional students prefer classes in the middle of day, nontraditional students often welcome early morning, late afternoon, evening, or even weekend classes that give them more flexibility with work schedules, so intensive scheduling can pay off in terms of student satisfaction as well.) Campuses are also seeking to expand summer and mini-term courses that get students into the classrooms year-round. Air conditioning a classroom building so that a handful of faculty can use their offices is not a responsible use of the institution's resources.

A critical step for most institutions is the development of a space inventory system that can be used in scheduling, asset assessment and management, and data tracking. Campuses need to understand exactly how much space they have, what condition it's in, and how it's being used. They also need to understand how much different spaces cost. A chemistry lab is more expensive to run than a history classroom. Some colleges and universities have begun tracking energy use down to the individual office and charging departments for the space they use. Even without going this far, departments need to understand that space costs the university money—it's not a free resource—and that it should be managed responsibly.

### Questions for institutional dialogue:

- How is space controlled and allocated on campus? How would you describe the general attitude toward space? Is it tightly held—even hoarded—or shared as a general resource?

- How does space allocation align with the mission of the institution?
- How is instructional space currently allocated? How efficiently is this space used? What policy changes would be necessary to increase space utilization? Who should be in charge of assigning class spaces and times? What should guide their decision making?
- How is space measured today? For what purpose? Is the space inventory up-to-date and reliable? How could the system be improved to provide for better tracking, projections, and planning?
- How do we track the cost of space? Do departments know how much their space costs? What technical improvements would be necessary to generate this

### Data Point: Space utilization

#### *Making the most of classroom space*

"To make more efficient, cost-effective use of space, institutions are developing strategies to spread out the times that classes are offered during day and evening hours, and to increase the teaching week by scheduling more Friday classes. Conflict can occur, though, between administration and faculty, which traditionally decides both when they want to teach and in what room. Questions regarding governance are being raised with most schools determining that class schedules are not related to academic freedom and should fall within the domain of department chairs and the administration.

"Schools are using a variety of tactics to encourage departments to offer classes during a wider time frame before resorting to taking over class scheduling. Scheduling has implications beyond facilities usage; there are academic ramifications, too. Students are often unable to get the courses they need to graduate because too many of them are offered at the same times. Other strategies to reduce pressure on facilities during peak times include offering more classes online and/or hybrids."

—Lucie Lapovsky, "The Higher Education Business Model: Innovation and Financial Sustainability," TIAA-CREF Institute, November 2013.

data? How could it be better communicated? Would the institution support a system that charges departments for their space?

- How can we incentivize better use of space?

#### 4. Expand data collection and analysis to cut costs and increase efficiency.

**The issue:** By increasing the amount of data they collect and providing new tools to analyze that data, institutions can strengthen their decision-making processes.

##### Strategies for success:

Business analytics has enormous potential for institutions seeking to make their operational decisions more data-driven. Higher education has lagged behind other industries in adopting business intelligence systems, but well-designed analytics systems have the potential to help institutions measure progress on strategic and tactical goals, support decision making, provide rapid feedback on ongoing efforts, and validate or discredit assumptions.

Colleges and universities can target the following goals with business intelligence systems:

- **Clarify costs and their drivers.** Integrated systems can make clear how colleges and universities are spending their money and identify areas for improvement.
- **Provide insight.** Analytics systems can help institutions meet their mission and address such goals as increasing retention and improving learning outcomes.
- **Share knowledge.** Data should be widely available across organizational units, along with tools to understand that data.

According to a recent report by EDUCAUSE and NACUBO, institutions should keep the following in mind when implementing business intelligence:

- **Get all senior leaders onboard.** Without the support of the president, senior leadership team, and governing board, business intelligence efforts will struggle to get off the ground.
- **Capture incremental improvements while pursuing transformative opportunities.** Even if the goal is institution-wide change, it makes sense to start small and celebrate successes along the way to build support and gain experience.

- **Be realistic.** Understand what business intelligence and other systems are actually capable of accomplishing—as well as what is required for success. These systems require significant commitments of time and staff before they save the institution a single dime. Benefits often take the form of cost avoidance rather than direct financial savings; they're more likely to lead to rebalancing of institutional resources rather than a pool of capital. Finally, change is hard, and increasing access to data doesn't affect or address entrenched attitudes or beliefs.
- **Address processes before systems.** Business intelligence systems can't magically solve any problem they encounter. Institutions need to refine their processes first, then find the systems that will support them.

Facilities are among the operational units seeing a real benefit from business intelligence systems for tracking materials, maintenance costs, energy use, and other metrics. New systems provide facilities staff with interactive dashboards that present critical information in charts, meters, and graphs and allow users to drill down to analyze data. When combined with modern building information modeling and smart buildings, staff have powerful tools to manage facilities operations.

##### Questions for institutional dialogue:

- What operational data is the institution already collecting? Who is responsible for this data? Where is it stored?
- Which processes and operations would benefit most from greater data accessibility and analysis? What sort of questions do you need answered?
- What is standing in the way of the adoption of business analytics systems? Cost? The accessibility and quality of data? The culture of the institution? How can these barriers be addressed and overcome?
- What data is currently available to the facilities organization? Is this data accessible and understandable? Is data from multiple sources integrated to provide a big picture?
- What would the advantages and costs be of investing in a data analytics system for the facilities organization?



## 5. Use the campus as a classroom to expand awareness of sustainability and facilities best practices.

**The issue:** Facilities organizations can develop innovative ways to use the built environment as a teaching tool and directly involve students with sustainability and efficiency efforts.

### Strategies for success:

Facilities staff typically have only limited interaction with students, and most students have no idea what goes into keeping the campus running. Yet facilities play an important role in the educational experience, and a peek behind the curtain at facilities operations can give students greater insight into issues of sustainability and energy use and raise awareness of facilities throughout the institution.

Treating the campus as a classroom means revealing what is usually hidden. Systems such as photovoltaic panels, green roofs, and constructed wetlands benefit from this approach; out in the open, they are a constant reminder to the campus of the sustainability priorities of the institution. Schools have also revealed mechanical systems normally invisible behind walls or exposed water pipes running through buildings to highlight high-efficiency air conditioning or gray water treatment systems. Creative, well-designed signs should accompany these visible green systems to explain their purpose and results. In fact, signage can play a role during construction as well; construction fences can be covered with signs explaining the elements of the new design and how they will benefit the campus.

Smart building systems can also be exhibited to students, faculty, and visitors on kiosks in building lobbies. Real-time displays of energy and water use, for example, serve as constant reminders that how people use buildings has an effect.

Other institutions have found success bringing students into facilities or sustainability offices as interns. Students benefit from real-world experience in the trenches of a campus and are exposed to a variety of po-

tential careers. Facilities organizations benefit by promoting their field as a career choice and gain insight into student perspectives. At West Virginia University, for example, interns in the Office of Sustainability work on the office website, organize campus events, and participate in studies such as waste audits and public transportation use. Many of the interns plan a career in sustainability.

Expanding the campus as a classroom is an effort that can start small—adding an educational component to the design of a LEED-certified building, for example, or hiring a single intern. To broaden the project, facilities organizations need to form partnerships with faculty. Seek out faculty interested in real-world ways to teach sustainability concepts and work together to develop courses or programs that combine the physical reality of the campus with the academic rigor appropriate to a college or university.

### Data Point:

#### The campus as classroom

##### *The building as a living laboratory*

The term “living lab” is thrown around a lot in sustainability, but few buildings take the idea more seriously than the Centre for Interactive Research on Sustainability (CIRS) at the University of British Columbia (UBC). The building is not only a LEED Platinum structure, it is designed to be “net positive” by returning surplus energy to the grid and removing emissions from the atmosphere.

The entire structure operates as a lab where researchers can study users’ interactions with the facility to improve performance and maximize the health, happiness, and productivity of inhabitants. Researchers housed in the building include faculty from applied science, psychology, geography, forestry, and business, as well as the UBC Sustainability Initiative. Ongoing research at CIRS includes studies of the thermal and acoustical properties of windows, thermal-slab monitoring, life-cycle costing, and the psychology of recycling. Already, more than a dozen academic papers have been published on work at the building, which opened in 2011.

**Questions for institutional dialogue:**

- How can the institution make the infrastructure—especially the green infrastructure—of the campus more visible to students, faculty, and staff?
- Where could well-designed signs explain operations going on behind the scenes?
- Does the campus have building information data that could be displayed to students in certain buildings? How can you use this data to influence the use of the building and promote awareness?
- Do the facilities or sustainability operation currently

hire student interns? What would it take to make this happen? (Is funding available? What's the process for advertising and hiring interns? Who would supervise the interns?) What jobs could interns do that would both help the department and give students real-world experience?

- How can facilities partner with faculty? Can you identify faculty members who would be interested in teaming up on educational projects and academic courses?

## CONCLUSION: Embracing and advancing the need for change

It is critically important to recognize the remarkable reforms and innovative efforts that are occurring right now at numerous colleges and universities. Furthermore, we would be remiss if we did not emphasize the diversity of institutions, the variability of their challenges, and the range of examples of creative responses to address these problems for which one size does not and will not ever fit all. Understanding institutional context and culture is a precursor to deriving very different solutions with very different performance levels to achieve successful student outcomes.

Nonetheless, we must embrace the need for change and the challenge of change today. To quote David Ward, emeritus chancellor of the University of Wisconsin Madison, “The real problem of change is the inability to scale change from segmented and disparate efforts to institutional strategies. Secondly, to assume that all changes will mesh with and serve all kinds of institutions is illogical.” This does not negate at all the need to face these challenges, but instead to recognize the varying starting points or conditions that we have to change.

We are indeed experiencing a new normal, an environment of rapid change where it's all about less. Yet, as resources have dwindled, expectations have grown. And, although the gap between the optimum and achieved institutional outcomes continues to beleaguer many senior administrators, change is possible and innovation is indeed occurring at a number of our colleges and universities. In fact, some institutions do have effective space management programs, focused mission statements, aligned institutional priorities, data-driven decision-making procedures, and sustainable budget models. The question is why the rest of us don't, and what we can do about it.

Therefore, much of this monograph has focused on strategies to help those institutions bridge the gap between the optimal goals and their current reality to continue tackling the most persistent higher education challenges:

- Inconsistent educational outcomes,
- Poor recruitment and retention efforts,
- Limited access and lack of affordability,
- Unsustainable, cumbersome funding models,
- Entrenched teaching methods,
- Ineffective space management policies,
- Unclear institutional mission,
- Aversion to risk, and
- Lack of environmental sustainability priorities.

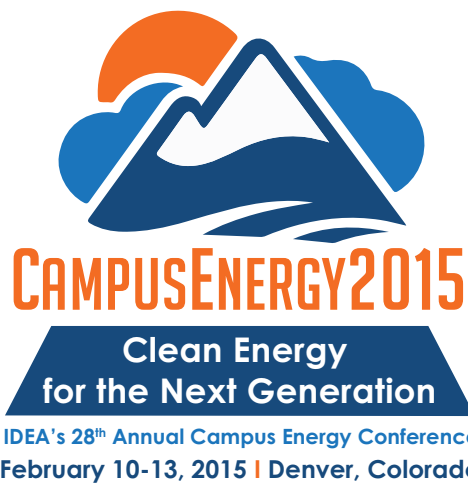
By leveraging facility assets and operations to maximum potential, the facilities department and staff can assist their colleges and universities in achieving desired goals and help bridge that gap. Indeed, this places even more pressure on facilities organizations to maximize their contribution to the core goals of the institution to achieve optimal outcomes. This will require a deliberate, albeit strategic focus on these approaches:

- Contributing to student success,
- Using total cost of ownership principles,
- Maximizing space management,
- Expanding data analytics systems, and
- Involving the campus community in sustainability and energy efficiency.

In this way, colleges and universities will be better able to leverage their facilities investment for the maximum return to the institution and focus on their mission of educating students and advancing knowledge.







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